PHILLIP'S GARDEN EAST: AN EXAMINATION OF THE GROSWATER PALAEO-ESKIMO PHASE

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ABSTRACT

This thesis is based on the excavation of Phillip's Garden East (EeBi-1), a Groswater Palaeo-Eskimo site situated on the west coast of the Great Northern Peninsula of Newfoundland. The site is interpreted as a seasonal camp occupied by Groswater groups during the late winter and spring and focused primarily on the exploitation of the harp seal migration. Occupation of the site appears to have recurred over a period of approximately 800 years.

Phillip's Garden East provides important new information on the Groswater phase. The large artefact assemblage contains the first Groswater organic artefacts including a number of harpoon heads. The recovery of an extensive faunal collection is also unique to this Groswater site. Certain artefact traits, a semi-subterranean house feature and a series of *ca.* 1900 B.P. dates from the site appear anomalous in the Groswater context as it is presently defined. Taken together, the data from the site necessitate a re-examination of Groswater material culture, settlement and subsistence, and culture history.

The definition of Groswater material culture is broadened to include a number of artefact traits previously excluded from the standard Groswater trait list. Eight radiocarbon dates on charcoal cover the period from *ca.* 2700 B.P. to *ca.* 1900 B.P. thus prolonging the Groswater phase by approximately 200 years. The site location and faunal collection suggest a strong maritime focus in at least part of the Groswater economy. The

new dates, certain artefact traits and raw material use patterns may indicate limited contact between Groswater and Early Dorset groups in Labrador and Middle Dorset in Newfoundland.

In a broader context, the enhanced definition of Groswater material culture supports earlier suggestions of close ties between Groswater and Independence II but also points towards similarities with a wide range of late Pre-Dorset and Early Dorset sites from across the Eastern Arctic.

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Members of the Archaeology Unit at Memorial University provided the stimulus and direction for the present research. Dr. Priscilla Renouf, as thesis supervisor and director of the Port au Choix Archaeology Project played a major role in all aspects of the present undertaking. Dr. James Tuck provided valuable insights into Palaeo-Eskimo culture history and much appreciated encouragement. I would also like to thank Dr. Ralph Pastore for his many insights and helpful suggestions of both an archaeological and more general nature. Clifford Evans, at the time Archaeology Lab Technician for the unit, is responsible for Figure 13. Valerie Andrews deserves special gratitude for the many, many hours spent entering artefact data into the computer. Finally, to my fellow graduate students, especially Kevin McAleese, who shared the trials and tribulations of graduate life and thesis writing, I would like to express my appreciation.

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Many other people contributed to the present undertaking in other ways. Patricia Sutherland whose advice, encouragement and assistance over many years has been invaluable in my pursuit of archaeology, deserves a special thanks. This work would not have been completed without the support and care of my family, especially during the past two years. Finally, to Rob Stewart for helping to put it all in perspective and for his patience, my sincerest gratitude.

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Chapter 1
Introduction

This study is based on excavation conducted at the Groswater Palaeo-Eskimo site of Phillip's Garden East (EeBi-1). The site is located in the Port au Choix National Historic Park on the west coast of the Great Northern Peninsula of Newfoundland (Figure 1).

The archaeological significance of the Port au Choix area has long been recognized. Local residents had picked up a number of artefacts and some human remains by the early part of this century (Howley 1915:330; Wintemberg 1939:86). The first systematic work by archaeologists occurred in 1927 and 1929 when Diamond Jenness and W.J. Wintemberg surveyed the east and west coasts of Newfoundland (Wintemberg 1939, 1940). In his report, Wintemberg (1939:85) makes special note of a rich archaeological site on the flat area referred to by the locals as Phillip's Garden.

More intensive investigation was undertaken by Elmer Harp Jr. in 1949, 1950 and 1961 to 1963. During these field seasons, Harp excavated a number of house structures at the Dorset site of Phillip's Garden as well as surveying and testing other areas of the Port au Choix and Point Riche Peninsulas (Harp 1951, 1964).

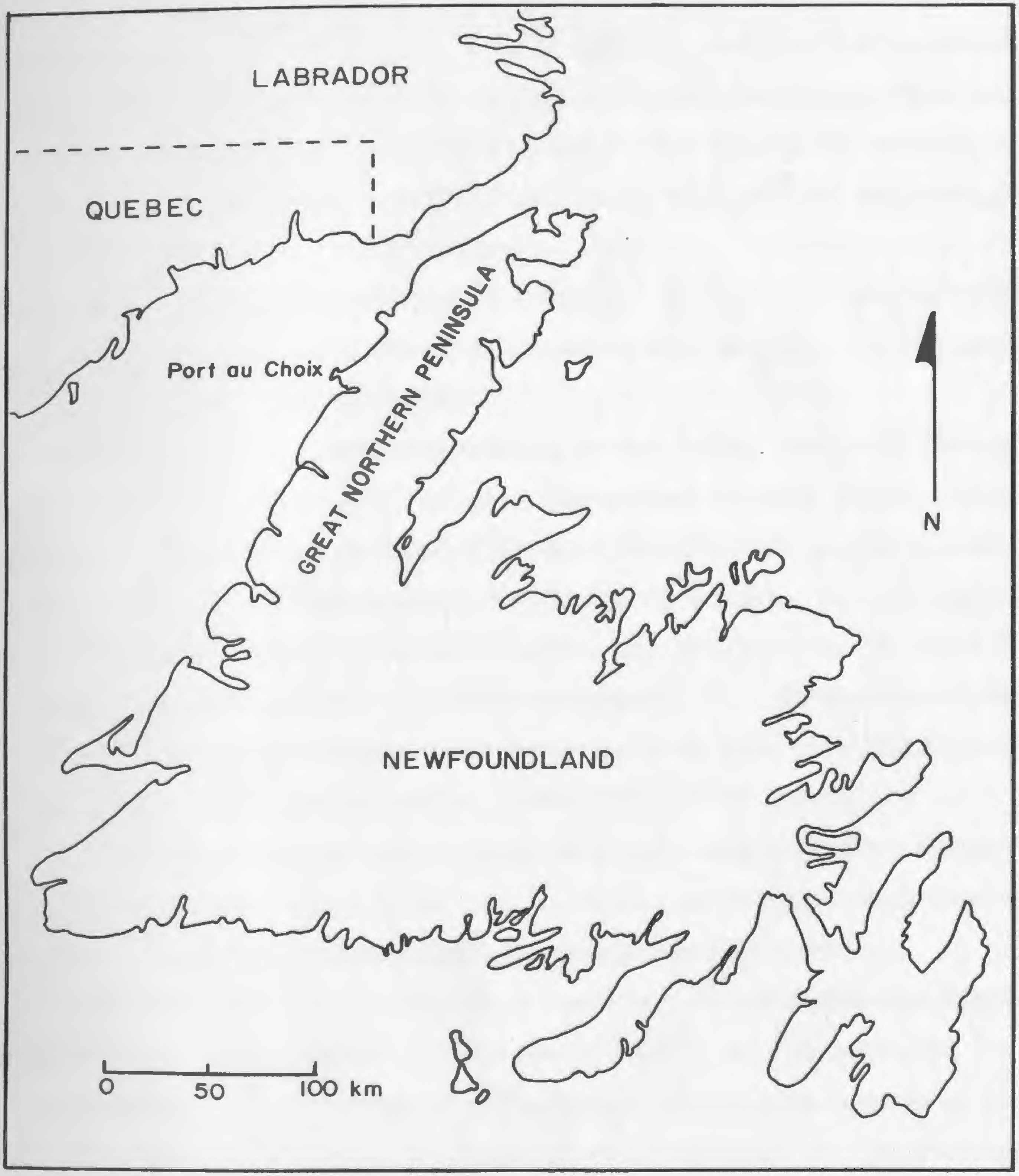

Figure 1: Location of Port au Choix National Historic Park

In 1967, focus shifted to the Maritime Archaic presence on the peninsulas when building construction in the community of Port au Choix uncovered human skeletal remains and numerous artefacts. Extensive excavation under the direction of Dr. James Tuck during the summer of 1968 yielded a wealth of material (Tuck 1970, 1971, 1976b) and brought the area to widespread public attention.

Dr. William Fitzhugh made a brief visit to Port au Choix in 1981 and located an additional Palaeo-Eskimo site as well as evidence of an early French occupation (Fitzhugh 1982).

The tremendous archaeological importance of the Port au Choix and Point Riche Peninsulas was officially recognized in 1984 when a large portion of the area was declared a National Historic Park and turned over to Parks Canada. At this time, a programme of intensive and systematic archaeological research was begun under the direction of Dr. M.A.P. Renouf of Memorial University of Newfoundland. The initial phase of the Port au Choix Archaeology Project involved three seasons of field work, from 1984 to 1986 (Renouf 1985a, 1985b, 1985c, 1986, 1987).

The past several years have seen additional Palaeo-Eskimo archaeological discoveries in the Port au Choix area that have necessitated salvage work (Linda Jefferson, personal communication, 1988).

Phillip's Garden East was one of a number of sites discovered during the systematic survey of the 1984 season of the Port au Choix Project. The initial testing of the site suggested its potential to add significantly to our understanding of the Groswater phase, seen as the terminal expression of the Early Palaeo-Eskimo tradition in Newfoundland and Labrador. Particularly important in this regard was the exceptional organic preservation for which the Port au Choix area sites are noted.

The objectives which guided research at the site can be viewed from a number of perspectives. On the most basic level, the excavation at Phillip's Garden East was part of the general investigation of the prehistoric occupation of the park. More specifically, the excavation was aimed at recovering data to permit a detailed examination of Groswater material culture and settlement and subsistence. It was also hoped that the excavation of Phillip's Garden East would provide new insights into Palaeo-Eskimo culture history in Newfoundland and Labrador.

This thesis involves a detailed analysis of the material recovered from Phillip's Garden East. The data from Phillip's Garden East is then used as the basis for a broader examination of the Groswater phase in the context of the Palaeo-Eskimo occupation of Newfoundland and Labrador and, more generally, of the Eastern Arctic.

Chapters 2 and 3 provide the reader with some basic background information. In Chapter 2 a general framework for the study is presented. This involves a brief sketch of Palaeo-Eskimo culture history in the Eastern Arctic and, more specifically, Newfoundland and Labrador, and a discussion of some of the problems associated with arctic archaeology. Chapter 3 outlines the environment and palaeo-environment of the Port au Choix area and discusses the resources available in this region.

Chapters 4, 5 and 6 present the description and analysis of Phillip's Garden East. The method of excavation and excavation results are reviewed in Chapter 4. Chapter 5 presents the detailed description and analysis of the artefact assemblage. Chapter 6 examines site function and seasonality and intra-site variability.

Chapter 7 goes beyond the specific information from Phillip's Garden East to examine the Groswater phase in Newfoundland and

Labrador. The available information on the phase is reviewed. This review is then used as the basis for a re-examination of Palaeo-Eskimo culture history in Newfoundland and Labrador and for inter-phase comparisons across the Eastern Arctic.

Finally, Chapter 8 is a brief summary of the main results of the study and of the areas highlighted for future research.

Although Palaeo-Eskimo culture history is briefly reviewed in Chapter 2 and discussed in greater detail in Chapter 7, some clarification of the basic terminology used in this thesis is required at the outset. Palaeo-Eskimo culture history in Newfoundland and Labrador has suffered from a plethora of confusing terminology. The Groswater Palaeo-Eskimo phase was originally designated Groswater Dorset (Fitzhugh 1972) and the phase was considered a regional variant of the widespread Dorset culture. The designation Groswater Dorset was used up until the 1980s (Cox 1978; Fitzhugh 1980b) and still appears in the literature from time to time (*cf.* Maxwell 1985). However a re-examination of Palaeo-Eskimo culture history has resulted in the phase being placed at the terminal end of the Early Palaeo-Eskimo tradition, distinct from the Dorset or Late Palaeo-Eskimo tradition. As a result, the term Groswater *sans* Dorset is now the preferred name (*cf.* Auger n.d.; Tuck and Fitzhugh 1986). As it appears in the present thesis, "Groswater Dorset" is used purely in historical contexts. Its use is retained in these contexts because of its implications in terms of the culture historical perspective of the researcher. The term Early Dorset was used in the original reports for the Norris Point (Bishop n.d.) and Factory Cove (Auger n.d.) sites on the west coast of Newfoundland, and for material from some of the sites in the Saglek Bay area of northern Labrador (Tuck 1975). This material is now recognized as Groswater. Early Dorset refers to a distinct phase marking the beginning of the Late Palaeo-Eskimo tradition.

Chapter 2

Frameworks for an Examination of the Groswater Phase

2.1 Introduction

In order to conduct a detailed examination of the Groswater Palaeo-Eskimo phase it is helpful to place the phase in context, both in terms of the culture history of the Eastern Arctic and, more specifically, Newfoundland and Labrador, and of the limitations of Palaeo-Eskimo studies. The chapter will begin with a brief outline of Palaeo-Eskimo culture history in the Eastern Canadian Arctic and Greenland. This will be followed by a review of the specific chronology in Newfoundland and Labrador. It should be emphasized that the purpose here is not to provide a critical evaluation of all the various interpretations of Palaeo-Eskimo culture history but merely to present the reader with a general framework within which to place the Groswater Palaeo-Eskimo phase. The history of archaeological research in the Eastern Arctic and the development and various interpretations of Palaeo-Eskimo culture history have received considerable attention in numerous publications over the past few years and the reader is referred to these for additional background information (*cf.* Anderson 1979; Dummond 1977; Dekin 1973, 1978; Fitzhugh 1984; Maxwell 1980a, 1984, 1985; McGhee 1974, 1976, 1978, 1982; Taylor 1968).

The second part of the chapter will examine some of the problems that have plagued Palaeo-Eskimo research. These issues will be introduced here as they relate to our understanding of the Groswater phase. Once again, many of these issues have been treated in more detail and in different or broader contexts elsewhere (*cf.* Dekin 1973, 1978; McGhee and Tuck 1976; Schindler 1985).

Further discussion and evaluation of these schemes and problems will be presented in subsequent chapters of this thesis in association with the data from Phillip's Garden East and the detailed discussion of the Groswater phase.

2.2 Palaeo-Eskimo Culture History in the Eastern Arctic

The terms "Paleoeskimo" and "Neoeskimo" were first suggested by H.B. Steensby (1917) to designate what he postulated were two main divisions in arctic prehistory. Steensby described the Neoeskimo culture as a relatively recent development with a coastal economy specially adapted for open water hunting. He suggested that the earlier Paleoeskimo culture had originated in sub-arctic areas and that it maintained its more "continental" economy as it moved north into the central Arctic, eventually adapting to the arctic coast (Steensby 1917:204-207). This early division was made primarily on the basis of ethnographic studies and speculation as archaeological research in the Arctic was virtually non-existent at this time. In 1973 the use of these terms was revised at a conference on Eastern Arctic archaeology (Maxwell 1976). Today, the term Palaeo-Eskimo is used to designate all pre-Thule arctic adapted cultures of the Western and Eastern Arctic (Maxwell 1976a:4). The following review will concentrate on the Palaeo-Eskimo cultures of the Eastern Arctic. The Eastern Arctic includes Greenland and the islands and mainland littoral of northern

Canada from Banks Island and Amundsen Gulf in the west to Newfoundland in the east (Maxwell 1985:6-7).

During the past 20 years, the pace of archaeological research in arctic regions has increased dramatically. However, as Dekin noted some years ago,

> Arctic archaeology has been a classic example of "The more we know, the less we know" because as we accumulated more knowledge of the diversity of evidence for behaviour, we became less sure of what we had known before, re-opening old questions with new data... (Dekin n.d.:71).

The first human occupation of the Eastern Arctic appears to have begun sometime between 4000 and 4500 B.P. and is known as the Arctic Small Tool tradition (ASTt). Over the years, a number of different hypotheses have been presented to explain the origin of the ASTt. Early researchers looked for a development from the Indian cultures of North America. Birket-Smith (1930) suggested that the origins of arctic adapted peoples would be found in the interior of the Northwest Territories, Jenness (1928, 1929,1933) sought origins among the Beothuk of Newfoundland and Meldgaard (1960a, 1962) considered the Indian cultures of Northeastern North America as the most likely ancestors. Further research has shown that ASTt groups are racially and culturally distinct from North American Indian populations and that their origin lies elsewhere (McGhee 1978:15; Maxwell 1985:37).

Today, most researchers would accept an ASTt origin in the west, in either Alaska, the Aleutians or Siberia (McGhee 1978; Maxwell 1980a:166, 1985). Among the many alternatives, three main hypotheses remain in the literature. In the first scenario, an early Asiatic group moved to the interior of Alaska, the Aleutians and the North Pacific about

10,000 B.P. Eventually these interior adapted groups moved to the coast resulting in the emergence of the ASTt *ca*. 4000 B.P. The second hypothesis sees an Asiatic development of the ASTt and a subsequent spread into North America at about 4000 B.P. The final suggestion is that the ASTt began in the Aleutians with an early migration along the south coast of Beringia. In all cases, the ASTt has developed as a distinctive cultural entity and begun its eastward spread by 4000 B.P.

Independence I and Pre-Dorset are the earliest expressions of the ASTt in the Eastern Arctic. The Independence I culture was first defined by Knuth (1954) on the basis of his work in Pearyland, northern Greenland, in the 1940s and 1950s. A series of good radiocarbon dates on charcoal of indigenous willow placed this culture between *ca*. 3900 and 3700 B.P. (Maxwell 1985:61). Until the early 1970s, Independence I was generally viewed as a High Arctic variant of the widespread Pre-Dorset culture (*cf*. Maxwell 1985:68). However, McGhee's (1976, 1979) work at Port Refuge, Devon Island, differentiated between two groups of settlements occurring in close geographic and temporal proximity but with seemingly significant differences between them. These differences included the type of house structures, settlement patterns and artefact styles. Based on this evidence, McGhee (1976, 1979) suggested two early migrations into the Eastern Arctic with the first of these resulting in the Independence I occupation and occurring approximately 300 years before the second migration which led to the Pre-Dorset occupation.

Despite this evidence, the exact relationship between Independence I and Pre-Dorset remains unclear, due partly to ambiguous dating (*cf*. Maxwell 1985). While Independence I is now fairly securely dated between 4000 and 3600 B.P., many Pre-Dorset dates are on sea mammal material and are thus considered unreliable (see McGhee and Tuck 1976 and below for a discussion of dating problems in the Arctic and implications for chronology). If only charcoal dates are accepted, as suggested by McGhee and Tuck (1976), the Pre-Dorset occupation begins *ca.* 3700 B.P. and is more recent than Independence I. However, marine dates for Pre-Dorset are as early as 4700 B.P. While no-one today would accept these dates as is, various methods have been developed to "correct" dates on marine materials. The most commonly used method is that presented by Arundale (1981) (see below). Following this method, Independence I and Pre-Dorset are seen to be contemporaneous or a slight priority is given to Pre-Dorset.

Another problem is in the interpretation of variability between Independence I and Pre-Dorset (Bielawski 1988). Sources of variability such as the local environment, post-abandonment processes and the seasonality of occupation remain poorly understood. In addition, the amount of acceptable variation within one cultural phase is unclear. As a result, three alternative explanations for the relationship between Independence I and Pre-Dorset remain in the literature (Maxwell 1980a:168). Independence I and Pre-Dorset can be interpreted as 1) two distinct, but coeval, cultures; 2) the result of two separate and sequential migrations; or 3) a single culture with regional and/or adaptive variants.

Pre-Dorset sites are found from central Labrador (and possibly insular Newfoundland, see below) to northwest Devon Island, west to Victoria and Banks Islands and south to Hudson Bay. Charcoal dates for this phase are from *ca.* 3700 B.P. to *ca.* 2800 B.P.; however, as indicated above the exact dating of Pre-Dorset remains disputed. Recent research has highlighted a number of Pre-Dorset variants across this geographic expanse. To the west, sites on Victoria and Banks Islands, most notably the Lagoon site, show a majority of Pre-Dorset traits but also contain distinctive elements, possibly indicative of Choris and Norton influences from the west (Arnold 1981). Similarly, the Seahorse Gully site on the south-central periphery of the Pre-Dorset area appears as a distinctive regional variant with a number of large chert mattocks, picks and gouges not found in other Pre-Dorset sites (Nash 1972, 1976; Meyer 1977). Pre-Dorset sites from Labrador also exhibit a certain regional cast and closer ties to Greenlandic cultures than to core area Pre-Dorset (Fitzhugh 1972, 1976a:113).

The Sarqaq phase in Greenland may also be considered as a very distinctive Pre-Dorset variant (*cf.* Maxwell 1985:103) or a distinct cultural phase occurring between Independence I and Independence II and belonging to this separate sequence (*cf.* Fitzhugh 1984:536).

Immediately following the Pre-Dorset occupation, two different cultural phases, Independence II and Groswater, have been recognized in different parts of the Eastern Arctic.

Independence II was first defined in Greenland by Knuth (1958, 1967) and dated between *ca.* 3000 B.P. and *ca.* 2500 B.P. Independence II occupations have since been recognized in various areas of the High Arctic (Fitzhugh 1984; Knuth 1981; McGhee 1976; Schledermann 1978; Sutherland n.d.a, n.d.b). The relationship between Independence II and other Eastern Arctic cultures is still disputed and Independence II has been variously described as a Pre-Dorset variant, a Dorset variant or a distinct phase which possibly had some influence on developing Dorset (Maxwell 1985; McGhee 1981).

As a cultural phase recognized in Newfoundland and Labrador, Groswater will be briefly discussed in the following section. Obviously, this phase is the main focus of the present study and its culture-historical position will be examined in much greater detail, especially in Chapter 7.

Following this transitional period, Dorset culture appears across the Eastern Arctic between *ca.* 2700 and 2500 B.P. depending on the area. The Dorset sequence is usually divided into Early, Middle and Late phases although the divisions are generally seen as rather arbitrary. Late Dorset marks the end of the Palaeo-Eskimo tradition. Approximately 1000 years ago a new migration from the west resulted in the Neo-Eskimo or Thule occupation of the Eastern Arctic.

2.3 Palaeo-Eskimo Chronology in Newfoundland and Labrador

In Newfoundland and Labrador, the Palaeo-Eskimo sequence is divided into two traditions. The Early Palaeo-Eskimo tradition, dated roughly between 4000 and 2000 B.P. includes Independence I, Pre-Dorset and Groswater manifestations. The Late Palaeo-Eskimo tradition, between 2500 and 500-400 B.P., consists of the Dorset sequence of Early, Middle and Late Dorset. However, as Tuck (n.d.:4) has noted,

> Despite several decades of research, and research which has increased dramatically in the past 15 years, there still remain some basic disagreements about the culture history of Palaeo-Eskimos in the province.

The earliest Palaeo-Eskimo occupation in the province is dated between 3800 and 3500 B.P. and is restricted to northern Labrador. It was first identified in the Saglek Bay area in 1969 (Tuck 1975). Tuck (n.d.) refers to these earliest groups as Independence I or Independence I-like, arguing that the greatest similarity is with the Independence I culture of Greenland and the High Arctic. However, he also notes certain differences between these two groups as is suggested by the "like" qualifier. Fitzhugh (1980b) and Cox (1978) on the other hand, have called these groups Pre-Dorset while also observing the similarity to Independence I.

The period between 3600 and 3000 B.P. sees a marked decrease in the evidence for Palaeo-Eskimo occupation in Labrador (Cox 1978; Tuck n.d.:20; Tuck and Fitzhugh 1986:163). Despite the population decline suggested by a reduced number of sites associated with this time period, there is a population expansion far to the south. The earliest evidence of a Palaeo-Eskimo occupation on insular Newfoundland appears at this time at Cow Head (Tuck 1978, n.d.:20). Artefact styles combined with dates of *ca.* 3000 B.P. link the initial occupation of Cow Head with the Late Pre-Dorset occupation in Northern Labrador. In addition, a small number of true spalled burins have been found at sites in several areas of Newfoundland including Bonavista Bay (Carignan 1975), White Bay (Linnamae 1975) and the south coast (Penney n.d., 1982) and are suggestive of a scattered Late Pre-Dorset occupation throughout the island.

The terminal expression of the Early Palaeo-Eskimo tradition in Newfoundland and Labrador is the Groswater phase (Auger n.d.; Tuck n.d.; Tuck and Fitzhugh 1986). Present evidence suggests that Groswater developed out of the earlier Pre-Dorset occupation.

An Early Dorset occupation seems to begin in Northern Labrador about 2500 B.P. when Groswater groups are still present in the more southerly regions of Labrador and insular Newfoundland. The appearance of Early Dorset is generally regarded as a population migration (Cox 1978; Fitzhugh 191980b:24; Tuck n.d.:36). At present, the Early Dorset occupation of the province seems to be restricted to Northern Labrador. Very few dates are available for the occupation which seems to be confined to a few centuries around 2500 to 2400 B.P.

The Middle Dorset phase sees a marked population increase and expansion in many ways similar to that of the earlier Groswater phase. Middle Dorset sites are found throughout the province, although they are most common in northern Labrador and on the island. The Middle Dorset occupation is dated between *ca.* 1800 and 1300 B.P. (Tuck n.d.:46).

The succeeding Late Dorset occupation appears to be confined to northern Labrador. This marks the end of the Palaeo-Eskimo presence in Newfoundland and Labrador. The reasons for the disappearance of Dorset populations, first from the island and then from Labrador, remain obscure.

2.4 Problems in Palaeo-Eskimo Research

Examining the material from Phillip's Garden East and, more broadly, the Groswater Palaeo-Eskimo phase, highlights a number of the problems which arise at various levels of Palaeo-Eskimo research. These problems can be examined at two different levels in the present context: 1) those that impede our definition of the Groswater phase itself, and 2) those that limit our understanding of the relationship between Groswater and other Palaeo-Eskimo phases in the Eastern Arctic. The present discussion will serve as a brief introduction to these issues. Problems related to our understanding of the Groswater phase will appear and be discussed at greater length throughout the thesis. The broader question of phase relationships in the Eastern Arctic will be examined in more detail in Chapter 7.

In archaeological terms, the Groswater phase is newly defined, having first appeared in the literature in 1972 (Fitzhugh 1972), and clearly the definition of the phase is still evolving. One of the main aims of this thesis is to further this evolution. In doing so, a number of limitations in the present definition of the Groswater phase will be emphasized. One of the basic problems is a trait list approach to cultural phase definition which tends to focus on certain particularly diagnostic artefact types and traits while ignoring much of the variability which occurs in collections from the phase. Thus, we retain a component of variable material whose placement in the phase remains problematic because its presence in Groswater collections often remains unreported. This approach clearly hinders accurate phase definition. It also impedes meaningful cultural comparison as it is the variable material that is most likely to point towards cultural relationships.

Related to this issue is the use of settlement-subsistence system definitions as culturally specific traits. Thus, we see the Groswater settlement-subsistence system defined in a certain way, often in contrast to the economic system of other Palaeo-Eskimo phases. This approach fails to recognize regional differences in patterns of resource availability which will necessitate different settlement-subsistence system adaptations even within a single cultural phase.

In the broader context of cultural comparison between archaeologically defined phases a number of additional issues arise. Ethnographic descriptions of arctic adaptation stress the need for information sharing over relatively large areas in order to assure survival in the event of a change in migratory patterns of critical resources or of local resource failure (*cf.* Balicki 1968, 1970, 1984). Further, in a recent study of historic population movements in the Canadian Arctic, Rowley (1985) has documented the dispersal and relocation of 27 groups over a two hundred year period. She notes that

> Mobility played a crucial role in Inuit survival. Not only in the seasonal rounds and trading voyages but also as a means of escape from a region when resources became scarce or as a method of ridding the community of an undesirable individual or group of individuals. That such long distance and large migration took place is of importance for our understanding of Inuit cultural development from the arrival of their ancestors in the area until the present day. This research suggests that we need to take this scale of movement into consideration in our reconstructions of Inuit prehistory. (Rowley 1985:17)

Arctic archaeologists have interpreted the widespread stylistic similarity of many Palaeo-Eskimo artefacts as evidence for this type of information sharing over vast areas (Maxwell 1985:54).

At the same time, researchers have recognized regional developments and differences across the Eastern Arctic (*cf.* Anderson 1979). A number of Palaeo-Eskimo phases, including Independence I and II, Sarqaq and Groswater, are at least partially defined on the basis of their apparent restriction to a particular geographic area within the Eastern Arctic. Clearly the researcher is faced with a major problem when attempting to draw appropriate geographic phase boundaries even if one recognizes that such boundaries may only be an archaeological construct to facilitate interpretation.

At the same time, a precise understanding of the temporal dimension of Palaeo-Eskimo phases is often hindered by dating problems unique to the Arctic. Charcoal samples from indigenous wood are rarely found in

Palaeo-Eskimo sites. Driftwood samples can obviously introduce substantial but indeterminate errors into the chronology. While other material is available for radiocarbon dating, much of it derives from marine animals. Research has shown that the marine reservoir has different ratios of ^{12}C, ^{13}C, and ^{14}C and a different isotope content than the terrestrial reservoir. This results in older dates from marine materials and obviously prohibits direct comparison of marine and terrestrially derived dates. Various attempts at rectifying this situation have been made (Arundale 1981; McGhee and Tuck 1976; Tuck and McGhee 1983). In their initial article, McGhee and Tuck (1976) outlined a number of possible adjustments to sea mammal dates in order to eliminate discrepancies in the chronological framework. They concluded that the best solution was not to use dates from sea mammal material. While this appears to resolve many dating inconsistencies, it also eliminates from use a substantial proportion of the available radiocarbon dates. In a more recent consideration of the problem, Arundale (1981) presented a scheme of corrected dates using laboratory-derived fractionation and sea reservoir correction factors. While some have accepted the usefulness of Arundale's scheme, the complex nature of the problem remains evident (*cf.* Maxwell 1985:42-43) and others continue to question the validity of any such corrections (Tuck and McGhee 1983). Geographic and temporal variability in the activity of marine carbon are suspected but poorly understood. In addition, different types of sea mammal tissue may require different correction factors. Finally, antler appears to give dates younger than other terrestrial materials, suggesting that the dating inconsistencies are not confined to marine materials (McGhee and Tuck 1976:14). As we have already seen, the acceptance of different dating schemes leads to different culture historical interpretations.

Fortunately, indigenous charcoal is relatively common in Groswater sites as many of these sites are found below the tree line. Thus, the Groswater phase itself is relatively well dated. (However, the dates from Phillip's Garden East suggest the need for further refinement of the temporal extent of Groswater, a fact not surprising given the relatively recent definition of the phase). The main problem here is the relationship between Groswater and other phases in the Eastern Arctic. One of the six dating related problems in arctic prehistory outlined by McGhee and Tuck (1976:7) is the timing of the Pre-Dorset to Dorset shift. Early dates, on non-charcoal material, suggest a transition to Early Dorset at the Alarnek site at *ca*. 2900 B.P. while fully developed Dorset at the T-1, Tyara and Lake Harbour sites is dated to *ca*. 2700 B.P. However, at this same time, Pre-Dorset continues to flourish on Victoria Island, the Barren Grounds and the west coast of Hudson Bay. If we accept these early dates for Dorset, it also means the Dorset culture is emerging in certain areas of the Eastern Arctic at approximately the same time as the Groswater development in Newfoundland and Labrador. As noted above, Groswater is seen as an Early Palaeo-Eskimo or Pre-Dorset affiliated phase and not a Late Palaeo-Eskimo or Dorset one. Clearly this has implications for the nature of the Pre-Dorset to Dorset transition in the Eastern Arctic.

Central to the issue of phase boundary definition is, once again, the question of variability and how to interprete the variability obvious in the archaeological record. Many factors clearly contribute to variability in the Palaeo-Eskimo archaeological record. Seasonality may determine the types of activities undertaken and, by extension, the types of artefacts used. For example, Maxwell (1985) suggests that burins would have been used primarily during the summer for tool manufacture in preparation for winter hunting. Palaeo-Eskimo house structures also vary seasonally (Maxwell 1985:62-64; Schledermann 1978). Ethnographic accounts suggest periods of congregation and dispersal in most Inuit groups on a seasonal basis to meet economic and social needs (Balikci 1968, 1970, 1984; Mauss 1950; Riches 1982). Obviously this would result in different settlement patterns.

A number of local factors may also lead to artefact, feature and settlement pattern variability in Palaeo-Eskimo sites. The appearance of chipped stone artefacts may differ depending on the flaking qualities of the available lithic raw material. The availability of soapstone and other lithic materials may also influence the appearance of the artefact assemblage. Diversity in house structures may depend in part on access to building materials such as wood. Local physiography, climate and resources will have a tremendous influence on the settlement pattern.

Finally, post-abandonment processes affect all archaeological assemblages to some extent. Removal and re-use of materials from the site by later populations and freeze/thaw cycles are just two examples of such processes.

While all these sources of variability are recognized in a general way, we lack a clear understanding of their specific manifestations in the archaeological record and therefore cannot accurately interpret this variability. Is it functional or stylistic or merely idiosyncratic? Does it reflect seasonal variability in activities or resource availability, different post-abandonment processes, temporal change or actual regional differences?

The validity of the phase boundary between Independence I and Pre-Dorset has received considerable attention in Palaeo-Eskimo literature (Bielawski 1988; McGhee 1976, 1979, 1981; Maxwell 1985) due to these very problems of interpreting variability and of uncertain dating. The relationship between Groswater, Independence II and a range of terminal Pre-Dorset and Early Dorset components from across the Eastern Arctic is another example of uncertain phase boundaries. As will be explored in Chapter 7, these phases show considerable temporal and stylistic overlap but also certain differences which have resulted in their, perhaps inaccurate, identification as discrete phases.

Chapter 3
Environmental Background

3.1 Introduction

In order to interpret meaningfully any archaeological data, and most especially data related to settlement and subsistence, it is essential to have an understanding of the environment with which the past culture was interacting. As one of the aims of the present undertaking is to determine site function and seasonality at Phillip's Garden East and, more broadly, to examine Groswater settlement and subsistence patterns, a discussion of the environment of Newfoundland in general and of the Great Northern Peninsula in particular is in order. While this discussion will, of necessity, deal primarily with the present environment, any information pertaining to the palaeo-environment at the time of the Groswater occupation will be included. Readers should be forewarned that this information is, at present, limited and that correlation with the archaeological data is often difficult. The second part of the chapter will focus on the resources, faunal, floral and other, which would have been available for exploitation by the Groswater inhabitants of Phillip's Garden East. Finally, the chapter will examine the implications of the resource data for the type of settlement/subsistence system possible in the Port au Choix area.

3.2 Environment and Palaeo-Environment

3.2.1 Geographical Location

The Port au Choix and Point Riche Peninsulas together form a larger peninsula which extends off the west coast of the Great Northern Peninsula of Newfoundland at approximately $50^{o}43'$N Latitude and $57^{o}22'$E Longitude (Figure 2). This location places Phillip's Garden East within the coastal lowlands of the Great Northern Peninsula but adjacent to the interior plateau and the Gulf of St. Lawrence at the southern end of the Strait of Belle Isle. The Groswater occupants of Phillip's Garden East would have been ideally situated to exploit the coastal waters of the Gulf of St. Lawrence and the lowland areas of the Great Northern Peninsula. The interior plateau would have provided additional resources at a slightly greater distance.

3.2.2 Geological Evolution

The land mass known today as Newfoundland began formation on a Precambrian rock base prior to the appearance of Iapetus, a pre-Atlantic ocean, sometime around 600 million years ago. Continental plate movement between 400 and 450 million years ago brought the North American and North African plates together, closing Iapetus. Approximately 375 million years ago, the Appalachian Mountains, which today reach their northeasternmost extent in Newfoundland, were formed. Subsequent tectonic activity between 200 and 150 million years ago resulted in continental drift and the emergence of the modern Atlantic Ocean. At this time, Newfoundland took up its present geographic position (Rogerson 1981).

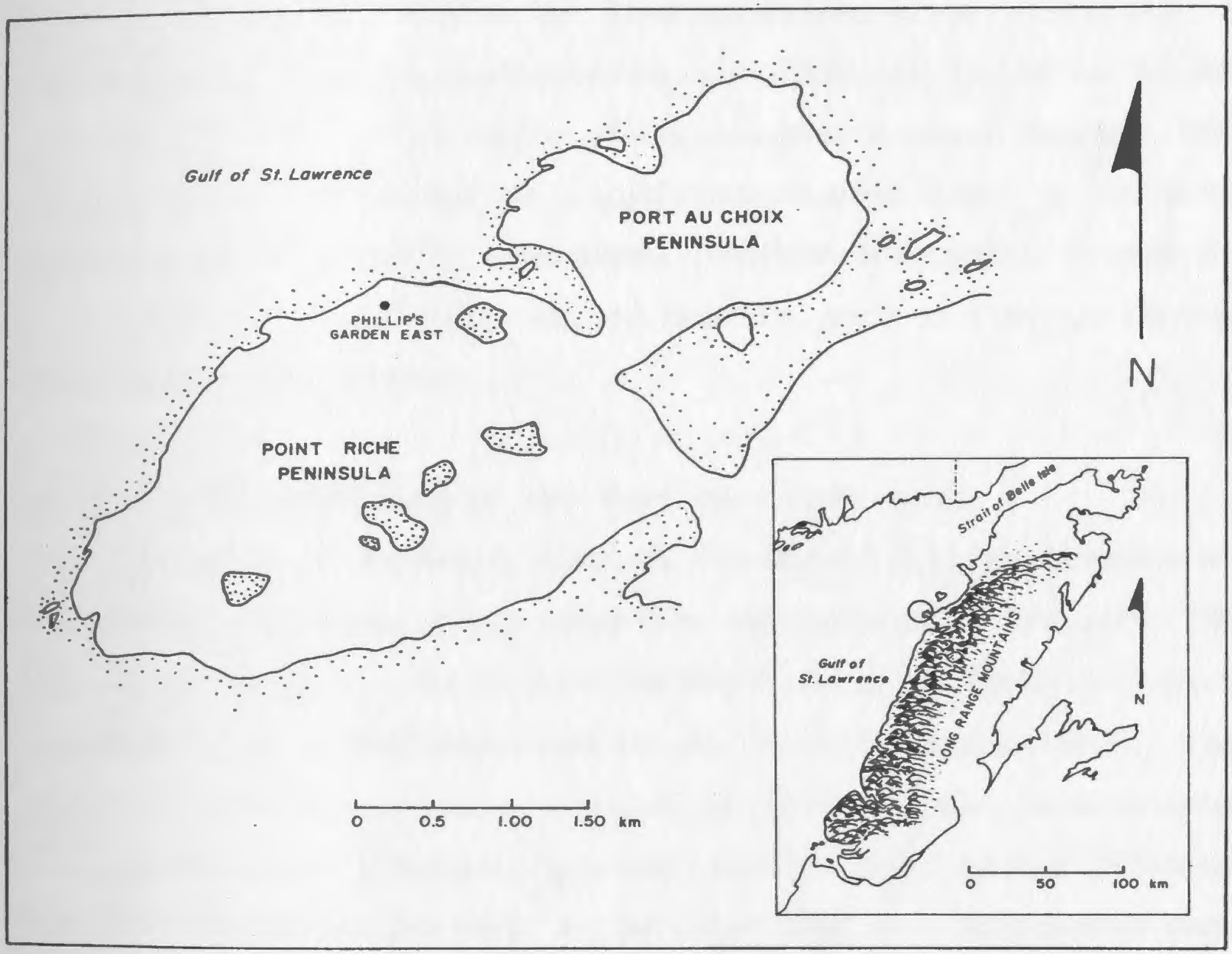

Figure 2: Location of Phillip's Garden East

A series of glacial events during the late Cenozoic dramatically altered the Newfoundland landscape, causing downwarping of the glaciated landmasses and scouring of the terrain. The late Wisconsin glacial maximum was the last of these events. Deglaciation of the island occurred over a period of several thousand years beginning about 13,000 B.P. A glacial re-advance occurred on the Northern Peninsula *ca.* 11,000 B.P. It appears that the Northern Peninsula was essentially ice free by *ca.* 10,000 B.P. (Grant 1973). With deglaciation, isostatic rebound began. This rebound is still occurring at significant enough rates in northern Newfoundland to result in continued coastline emergence despite the world-wide rise in sea level. Raised beaches, such as those at Port au Choix, attest to this rebound.

3.2.3 Environment of the Port au Choix Area

The Northern Peninsula exhibits a dramatic division between the high plateau of the Long Range Mountains and the adjacent lowlands. The Long Range Mountains, which form the backbone of the Peninsula, rise to elevations of up to 800 metres above sea level (Rogerson 1983). This relatively flat plateau is composed of igneous and metamorphic precambrian rock, primarily granite and granitic gneiss (Fleming 1973:20). The coastal lowlands, on the other hand, are composed of rocks deposited during the Cambrian and Ordovician periods in a shallow water environment. These include sandstones, carbonates, limestones and dolomites (Northland Associates 1985:23). There are, however, several exceptions to this general pattern. In the area between Bonne Bay and Portland Creek which includes the Cow Head quarry (see Chapter 5.3.2), sandstones, thin bedded limestones and shales, and limestone conglomerates occur. The fossils and sedimentary structures in these rocks indicate a deep water depositional environment and high levels of deformation. These deposits probably represent allochthonous (or transported) masses which originated in the plateau to the east (Fleming 1973:20-22).

The Great Northern Peninsula is in a transitional zone between the boreal forest and the tundra. More specifically, the Port au Choix area is at the extreme southern edge of the Strait of Belle Isle Ecoregion (Damman 1983:195). The vegetation in this ecoregion approaches that of the tundra. The rocky coastal barrens are generally without forest cover although tucamore, or wind formed stunted forest, does occur, the main species being black spruce (*Picea mariana*), white spruce (*Picea glauca*), and balsam fir (*Abies balsamea*) with some white birch (*Betula papyrifera*). Soils in the area are generally shallow with extensive areas of exposed bedrock (Damman 1983:196). Bogs are common throughout the area and peatlands have developed from the accumulation of peat moss (*Spagnum fuscum*) beginning with the wetter conditions of the sub-Atlantic *ca.* 2500 B.P. In the Port au Choix area, peat soils belong to the Atlantic Plateau Bog. While most soils in Newfoundland are acidic, the peat soils at Port au Choix are on limestone barrens and the combination of water movement and the high base content of the seepage water results in basic soils with a pH of 6.52 of higher (Wells and Pallett 1983:230).[1] It is the presence of these basic soils that results in the exceptional organic preservation for which the Port au Choix area sites are noted.

Immediately adjacent to the Strait of Belle Isle Ecoregion are the Coastal Plain and Beaver Brook subregions of the Northern Peninsula

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[1] Tuck (1976:2) notes a pH of 8.00 from the Maritime Archaic beaches at Port au Choix with crushed shell possibly responsible for the higher reading.

Forest Ecoregion (Damman 1983). Ombotrophic bogs cover most of the coastal plain in these subregions. Productive forest composed of balsam fir and, at higher elevations, black spruce occurs in the Beaver Brook Limestone subregion (Damman 1983:182).

Finally, the Gulf of St. Lawrence is of significance due to the influence it exerts on the adjacent terrestrial environment and also because of its own unique resources. The sub-arctic waters off Newfoundland are particularly resource rich due to the mixing of the warm Gulf Stream and the cold Labrador current. These resources will be discussed below.

In general terms, the climate of Newfoundland is a function of the Northern Hemisphere mid-latitude atmospheric circulation, the location of the island in relation to mainland Canada, and its proximity to a large cold ocean surface (Banfield 1983a, 1983b). The northern Peninsula Climatic Zone is characterized by long, cold winters with continuous snow cover for an average of up to three months. Summers are short and cool with high average cloudiness. Annual precipitation near the coast is between 900 and 950 mm (Banfield 1983a:51). Ice floes, which are usually present from December through until June or July, eliminate the moderating effects of the sea in winter and retard the onset of spring (Damman 1983:195).

3.2.4 Palaeo-Environmental Reconstruction

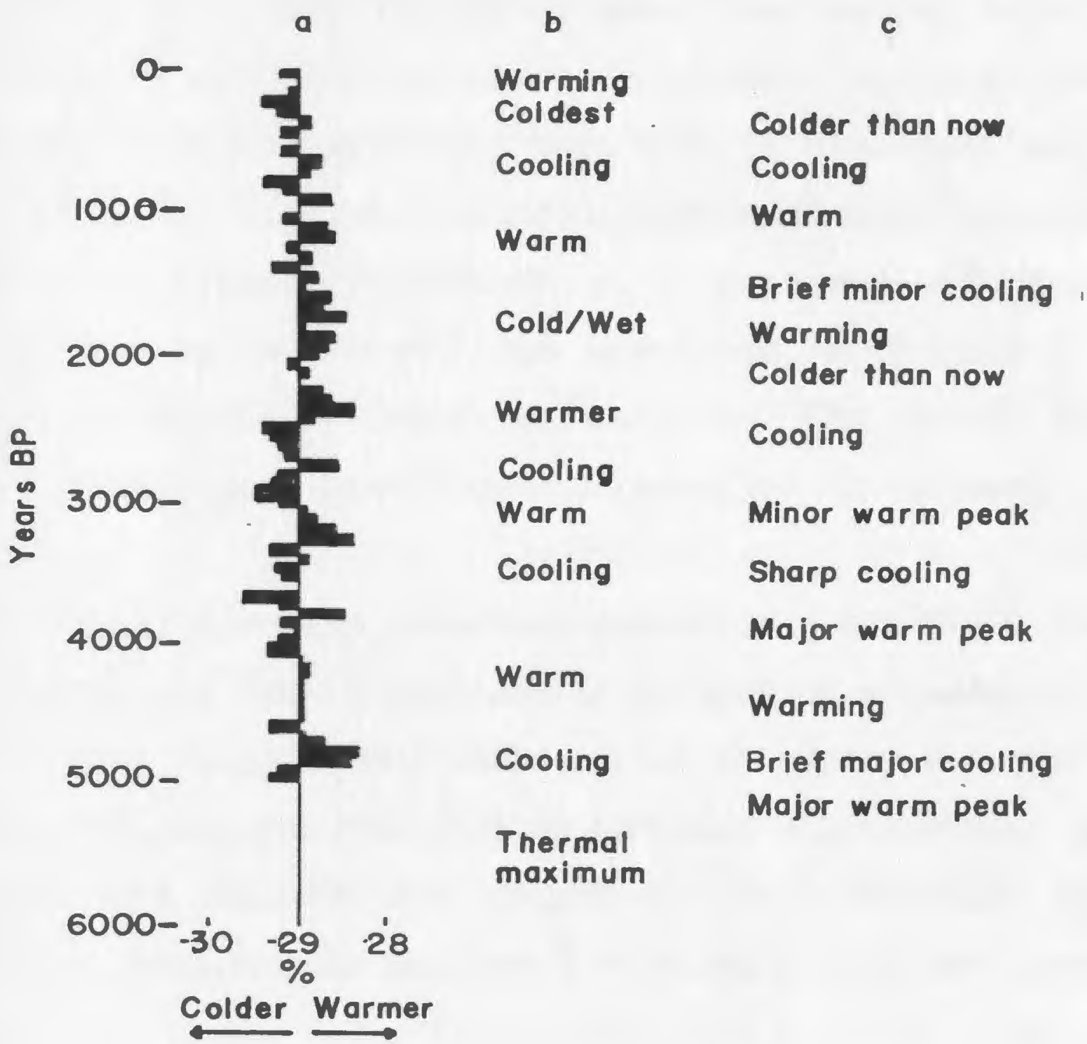
Many attempts at reconstructing palaeo-environments for arctic and sub-arctic areas have been undertaken. Unfortunately, there are numerous problems associated with correlating palaeo-environmental and archaeological data. Isolating accurate indicators of environmental change is a major problem in itself. Once evidence of change is found, its effects on the total environment must be determined. For example, a cooling trend may affect certain species favourably while being disastrous for others. Such relationships are certainly never simple. In most cases, dating of a precision needed to permit meaningful correlation of palaeo-environmental and archaeological events is lacking. Finally, it is apparent that many of the environmental changes that would have been of archaeological significance are too geographically or temporally restricted to permit detection by present means (*cf.* Tuck and Pastore 1985). As Fitzhugh and Lamb (1985:359) note

> ...most studies of climate-culture interactions in the Eastern Arctic are based more on presumed interactions than on the application of scientific principles demonstrating cause and effect relationships.

Nevertheless, our current understanding of palaeo-environmental conditions in the Eastern Arctic does provide some important insights.

Most recent discussions of climatic change in relation to culture history in the Eastern Arctic have referred to the work of Barry *et al.* (1977). Their scheme will be briefly reviewed here (Figure 3). Deglaciation was generally complete in the Eastern Arctic between 11,500 and 8000 B.P. Between 6000 and 5000 B.P. evidence from eastern Baffin Island suggests a thermal maximum. Other data indicate the presence of more open water in the Arctic between 6500 and 4500 B.P., a second warm peak in northeastern Greenland between 4500 and 3000 B.P. and a second major warming episode in the Eastern Arctic between 4600 and 3600 B.P. A marked cooling trend is thought to have begun across the entire Western and Central Arctic from 3600 to 3400 B.P. with a possible warmer and drier interval between 3200 and 2800 B.P. In the Mackenzie, Keewatin and Labrador areas a marked cooling appears to begin at 3000

B.P. with an intensification at 2500 B.P.; however, the data are somewhat ambiguous and the exact timing of this period is uncertain. This pronounced cooling probably lasted through until 2100 B.P. At *ca*. 1900 B.P. warming begins in some areas of the Eastern Arctic. This warming reaches a peak in the so-called "Medieval Warm Epoch" from 1100 to 800 B.P. After 800 B.P. another cooling trend begins, culminating in the "Little Ice Age" between 400 and 100 B.P. Following this, the northern climate has warmed somewhat to its present state.



a $\delta^{18}O$ concentrations in Greenland

b Inferred summer temperature for eastern Baffin Island

c Inferred summer temperature for Keewatin

Figure 3: Proposed climatic sequence for the Eastern Arctic (after Barry et al. 1977:Table 3).

Following this scheme, the major cooling trend beginning approximately 3000 years ago would correlate with the beginning of the Groswater occupation of Newfoundland and Labrador. While there has been general agreement about the occurrence of this cooling, there is less consensus about its exact time of onset. In addition, trying to correlate these general data derived primarily from work in Greenland and other central arctic areas with the specific palaeo-climatic situation in Newfoundland is extremely difficult, as is any such extrapolation. Furthermore, Terasmae (1961:667) has noted that Newfoundland lacks many of the species used as climatic indicators and that climatic changes felt in adjacent areas may have been moderated by the influence of the Atlantic Ocean.

A very recent review of climatic change in northern North America by Diaz, Andrews and Short (1989) serves to highlight a number of these issues. Their study suggests that while cooling may have begun in some areas of the Arctic around 3000 B.P. in Labrador a temperature decline does not begin until *ca.* 2200 B.P. (Figure 4). Thus, this major cooling trend would be more closely associated with the end of the Groswater phase.

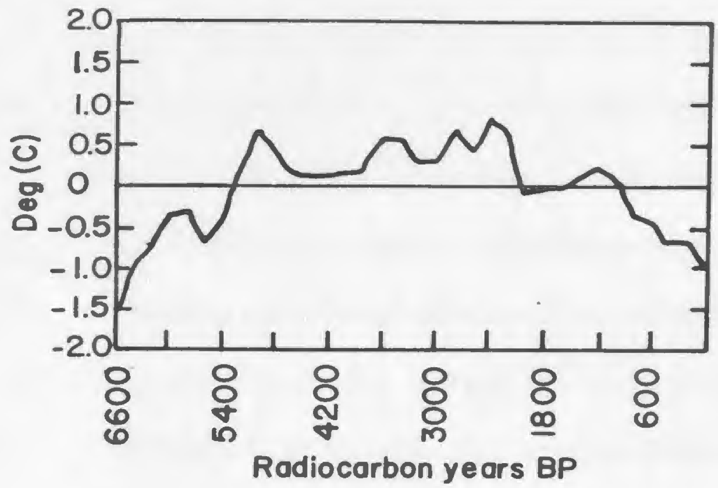


Figure 4: Reconstructed mean July temperature departures from the 1600 B.P. value for Labrador (after Diaz, Andrews and Short 1989:Figure 7).

More specific information on climatic change in Newfoundland comes from palaeo-botanical studies. At present, the sequence of vegetation change on the island of Newfoundland is poorly understood, and the correlation between vegetation change and climatic change is also complex. Palaeo-botanical reconstructions using pollen analyses of peat/lacustrine sediments and C-14 dating have been undertaken in various parts of the island and these data are of some use to us. The general vegetation sequence developed for Newfoundland and Labrador is as follows. In the immediate post-glacial period (*ca.* 10,000 B.P.), the emerging vegetation is tundra-like consisting of sedges, grasses and willows. In southern areas there is some evidence for slightly more shrub, birch and boreal forest pollen although some of this may be intrusive. At *ca.* 8000 B.P. the amount of birch increases, followed by the development of alder shrub and boreal forest. Pioneer vegetation begins in southwestern Newfoundland about 7000 B.P. In Labrador, birch and alder thickets begin at 6000 B.P. with boreal forests developing in the interior by 5000 B.P. while the coastal areas retain the birch and alder vegetation. By 4000 B.P. boreal forests of spruce, fir and white birch are general throughout much of Newfoundland. Between 4000 and 2000 B.P. there is some evidence for a slight shift to a more northern forest aspect associated with the climatic deterioration outlined above (Macpherson 1981:209).

Core samples were taken from ponds in the Port au Choix area in 1987 but the results of these studies are not yet available. At present, the nearest analyzed data come from L'Anse aux Meadows (McAndrews and Davis 1978; Macpherson 1985a, 1985b). In general terms, these data suggest little change in the pollen assemblages during the past 7500 years. The main vegetation is forest tundra (alder, birch and spruce) (Macpherson 1985a:267-269). The birch maximum between 7500 and 6600 B.P. is the only definite divergence (Macpherson 1981:191).

Clearly there are limitations in our present understanding of palaeo-climatic conditions in the Eastern Arctic and, more specifically, in Newfoundland and Labrador. In addition, we have little understanding of the complex relationships between climatic change, resource availability and cultural change. Present data prohibit any meaningful correlation between climatic change and the Groswater phase. However, whether a major cooling trend is associated with the beginning or the end of the Groswater phase is certainly an important issue and one which, hopefully, will receive greater investigation and clarification in the years to come.

3.3 Resources

3.3.1 Introduction

Given the location of Phillip's Garden East, it is likely that marine, terrestrial and avian fauna would all have been important in the economy of the Groswater inhabitants of the site. While avoiding undue detail, the following discussion will attempt to provide a comprehensive outline of all potential resources in the area. In the subsequent analysis (Chapter 6), the actual resource data obtained from the site in the form of faunal material will be compared to this base line in order to examine the specific resource use patterns at the site.

3.3.2 Marine Mammals

The coastal nature of most Palaeo-Eskimo adaptations combined with the specific location of Phillip's Garden East argue for the importance of marine resources to the inhabitants of the site. The coastal waters in this area are particularly resource rich (*cf.* Maxwell 1985:15). Based on present and historically known patterns, a variety of marine mammals including seals, walrus and smaller species of whale (Table 1) would have been available either year round or on a seasonal basis.

Table 1: Marine mammals

COMMON NAME	SCIENTIFIC NAME
harbour seal	*Phoca vitulina concolor*
harp seal	*Phoca groenlandica*
hooded seal	*Cystophora cristata*
grey seal	*Halichoerus grypus*
ringed seal	*Phoca hispida*
bearded seal	*Erignathus barbatus*
walrus	*Odobenus rosmarus*
pilot whale	*Globicephala melaena*
minke whale	*Balaenoptera acutorostrata*
white-sided dolphin	*Lagenorhynchus acutus*
Atlantic harbour porpoise	*Phocoena phocoena*

The harp seal is the most important seal species in coastal Newfoundland. The Northwest Atlantic harp seal is divided into two herds, the Front herd which breeds off the south coast of Labrador and the Gulf herd breeding in the Gulf of St. Lawrence (McLaren 1962). It is the Gulf herd which is important in the Port au Choix area. In late February or early March the harp seals haul out in dense herds to whelp. Almost all of the young are born in the first two weeks of March (Templeman 1966:128). The seals remain in the breeding grounds around the Magdalen Islands until late April (Mansfield 1967:13). At this time they begin their northward migration to Greenland. The migration often brings the seals close to shore along the west coast of Newfoundland. The fall migration begins in late September but it is not until mid-December to early January that the harp seals reach the Strait of Belle Isle area and they usually stay far off-shore at this time. During January and February the harp seals remain dispersed in the Gulf area (Bowen 1985).

The hooded seal is another migratory species which breeds in the Gulf of St. Lawrence. They form large but widely separated groups on the ice in late March for whelping. After whelping they migrate north to Greenland, returning to the Gulf in September (Mansfield 1967). The hooded seal population is much smaller than that of the harp seal and their breeding grounds are found to the west of those of the harp seal. As a result, hooded seals only occasionally come close to the shore along the west coast of Newfoundland (Sergeant 1985; Northcott and Phillips 1976:25; Templeman 1966:135).

The harbour seal is the only species of seal that resides permanently in the waters off Newfoundland. Harbour seals are common along the west coast, occurring in small, isolated populations in inlets and bays (Beck 1983b). Whelping occurs in late May in the Gulf of St. Lawrence and surrounding areas (Boulva and McLaren 1979). At this time the seals haul out on sandbanks, reefs and islands along the coast and in river estuaries. Usually only a single pup is born (Mansfield 1967). During the summer and fall, the seals will often sun and rest on beaches, rocks or tidal reefs (Boulva and McLaren 1979). While remaining in the area during the winter, the seals rarely haul out at this time. In addition, since they do not maintain breathing holes, they must remain off-shore if *sina* or landfast ice forms (Boulva and McLaren 1979). Thus, the harbour seal is most accessible in the Port au Choix area from spring until late fall (Northcott and Phillips 1976:24).

Grey seal, ringed seal and bearded seal are sometimes found along the west coast. Grey seals frequent summer feeding grounds along the west coast although they usually remain further south than the Port au Choix area (Beck 1983a; Mansfield 1967). The ringed seal may appear along the coast of northeastern Newfoundland on drifting ice in the spring. As ringed seals are dependent on stable ice during the winter and spring, their occurrence around Newfoundland is limited. Bearded seal are also generally found further to the north but may appear on drift ice along the west coast in the spring. If we accept that the Groswater phase occurred during a period of colder climate, these latter species may have been more common in the Port au Choix area at this time.

Today, walrus do not occur in the study area; however, historic accounts suggest that they were present in the Gulf of St. Lawrence in the past (Mansfield 1959; Northcott and Phillips 1976:9) and, once again, the colder conditions at the time of the Groswater occupation may have been more favourable for walrus. The walrus is a gregarious animal and may occur in large herds. It is associated with pack ice on which it hauls out to breed and rest.

The coastal areas off Newfoundland are known for their wide variety of whales. The larger species of whale, including blue, finback, humpback, sei, sperm, baleen and right, occur along the northeast coast of the island and off Labrador but are seldom found in the Gulf of St. Lawrence. However, smaller whales such as the pilot and minke do occur in large numbers in the Gulf. They occasionally become stranded and may also be driven ashore (Templeman 1966). The white-sided dolphin and the Atlantic harbour porpoise are also found along the west coast during the summer and fall (Northcott and Phillips 1976:25-26).

The distribution of marine mammals in the Port au Choix area at the time of the Groswater occupation was probably very similar to the present distribution (Northcott and Phillips 1976:9) with the exceptions noted above.

3.3.3 Other Marine Resources

While the greatest abundance of fish occurs on the Grand Banks and off the northeast coast of the island, a number of fish species are found along the west coast (Table 2). Most of these species are solitary and many prefer deep off-shore water; however, concentrations often occur during the spring and summer at which time the fish may be found in great numbers in the shallow coastal waters and river estuaries (Templeman 1966:91).

Atlantic cod, Atlantic halibut, American plaice, winter flounder, herring and capelin all congregate in the shallow water off the west coast during their respective spawning periods which occur throughout the spring and summer months. In the winter, they are usually off-shore in deep water. Redfish, mackeral and the large bluefin tuna are occasional visitors to the coastal waters during the summer months. American smelt are found in river estuaries throughout the fall, winter and spring until the spawning occurs between late April and early June. Three other species of anadromous fish, the Atlantic salmon, brook trout and Arctic char move between the open ocean and the rivers of western Newfoundland. Atlantic salmon usually spawn in October or November. Most of the salmon enter the rivers in the late summer and early autumn immediately before the spawning period however some move into fresh water in the spring or early summer (Leim and Scott 1966:109-110). Brook trout move out of the river estuaries and into the shallow coastal waters in May and June. They return to the rivers in July and usually spawn in October and November. Arctic char spend the summer months in the coastal waters close to river mouths, and return to the rivers to spawn in the late fall (Templeman 1966).

Table 2: Fish available in marine waters

COMMON NAME	SCIENTIFIC NAME
Atlantic cod	*Gadus morhua*
Atlantic halibut	*Hippoglossus hippoglossus*
American plaice	*Hippolossoides platessoides*
winter flounder	*Pseudopleuronectes americanus*
herring	*Clupea harengus harengus*
capelin	*Mallotus villosus*
redfish	*Sebastes mentella*
mackeral	*Scomber scombrus*
bluefin tuna	*Thunnus thynnus*
American smelt	*Osmerus eperlanus mordax*
Atlantic salmon	*Salmo salar*
brook trout	*Salvelinus fantinalis*
Arctic char	*Salvelinus alpinus*

The final marine resources of potential economic importance include a variety of shellfish, both crustaceans and molluscs (Table 3), and seaweeds such as Irish moss, kelps, red seaweed and rockweeds. All of these are available in the shallow coastal waters off Newfoundland (Templeman 1966).

Table 3: Shellfish

COMMON NAME	SCIENTIFIC NAME
American lobster	*Homarus americanus*
pink shrimp	*Pandelus borealis*
snow crab	*Chionecetes opilio*
rock crab	*Cancer irroratus*
squid	*Illex illecebrosus*
sea scallop	*Placopecten magellanicus*
soft-shelled clam	*Mya arenaria*
bar clam	*Spisula solidissima*

3.3.4 Riverine/Lacustrine Resources

There are no true fresh water fish on the island of Newfoundland; however, a variety of fish are found in the lakes and rivers (Frost 1938; Scott and Crossman 1963, 1973). The most important of the anadromous species have been noted above. Additional species are listed in Table 4. Of these, only the American eel and threespine stickleback occur with any frequency. There are no major rivers or large lakes on the Port au Choix and Point Riche peninsulas making the exploitation of riverine/lacustrine fish species unlikely at this site.

Table 4: Fish available in inland waters

COMMON NAME	SCIENTIFIC NAME
American eel	*Anguilla rostrata*
mummichog	*Fundulus hereroclitus*
tomcod	*Microgandus tomcod*
fourspine stickleback	*Apelles guadracus*
threespine stickleback	*Gasterosterus aculeatus*
twospine stickleback	*Gasterosteus wheatlandi*
ninespine stickleback	*Pungitius pungitius*
American sandlance	*Amenodytes americanus*
windowpane	*Scophthalmus aquosus*
alewife	*Alosa preudoharengus*
American shad	*Alosa sapisissima*
banded killifish	*Fundulus diaphanus*
sea lamprey	*Petromyzon marinus*
Atlantic sturgeon	*Acipenser oxyrhynchus*

3.3.5 Land Mammals

The sub-arctic land environment is generally characterized by an extreme climate with winters that are not hospitable to many species, resulting in migration and various forms of dormancy (Dunbar 1968:51).

While the climate of Newfoundland is not as severe as many sub-arctic areas, it remains a harsh one. Another important characteristic of insular Newfoundland is the apparent effectiveness of the Strait of Belle Isle as a barrier separating the island from the mainland and prohibiting the easy transference of animal populations (Northcott 1974).

As a result, amphibians, true fresh water fish and reptiles are absent from the island. The mammalian fauna is small and shows a preponderance of the larger carnivorous northern species. Only 14 species of mammal are indigenous to the island, with two additional species appearing as seasonal visitors (Table 5). Nine of these are sub-species peculiar to insular Newfoundland and suggest colonization of the island shortly after deglaciation (Cameron 1958). The indigenous species of potential significance in the Groswater economy will be discussed below.

Table 5: Land mammals

COMMON NAME	SCIENTIFIC NAME
caribou	*Rangifer tarandus caribou*
beaver	*Castor canadensis caecator*
muskrat	*Ondatra zibethicus obscurus*
otter	*Lontra canadensis degerer*
weasel	*Mustela erminea richardsonii*
marten	*Martes americana atrata*
Arctic hare	*Lepus arcticus bangsii*
red fox	*Vulpes vulpes deletrix*
lynx	*Lynx lynx subsolanus*
Newfoundland wolf	*Canis lupus beothucus*
black bear	*Ursus americanus hamiltoni*
*Arctic fox	*Alopex lagopus ungava*
*polar bear	*Ursus maritimus*
meadow vole	*Microtus pennsylvanicus terraenovae*
little brown bat	*Myolis lucifugus lucifugus*
Eastern long-eared bat	*Myolis keenii septentrionalis*

* Seasonal visitors

The caribou present in Newfoundland are now assigned to the sub-species woodland caribou (*Rangifer tarandus caribou*) although they were once were thought to be a distinct sub-species (*Rangifer caribou terraenovae*) (Dodds 1983:527). Ethnographic and recent studies give us a good deal of information on the behaviour of the woodland caribou in Newfoundland. The caribou inhabit both the barren open areas and coniferous forest regions of the province, eating primarily lichens (Northcott 1974). The woodland caribou are generally gregarious animals. Breeding usually occurs in October on the open bogs and barrens (Bergerud 1961). At this time, herd size may increase to up to 1000 animals as stags and does come together to form rutting companies (Northcott 1974). Calving grounds are found on the plateaus of the interior and are returned to each spring (Northcott 1974). Calves are born during the first weeks of June (Bergerud 1961). In the late spring and summer as the flies emerge, the caribou head first for the shaded sides of the mountains which retain snow longer, and then for open, windy heights (Bergerud n.d.). Males lose their antlers in December or January, while the females and juveniles retain theirs until March or April (Cameron 1958).

Historically, three distinct caribou herds have been found on the island: one in the Long Range Mountains, a second in the central and southern parts of the island, and a third, smaller and apparently non-migratory herd, on the Avalon Peninsula. The fall migration of the Long Range Mountain herd begins with the first heavy snowfall which usually occurs shortly after the breeding season. Herds of 3 to 100 animals move, usually by day, to the open plains of the south coast and the barrens, although some animals may remain in the Long Range Mountains throughout the winter. During the winter, the caribou band together in groups of up to 40 individuals and are constantly on the move seeking food (Bergerud n.d.). In the spring, the Long Range Mountain herd returns to the calving grounds in the plateau areas of the mountains.

Beaver, muskrat and otter occur along the lakes and streams in wooded parts of the island. Beaver and muskrat may also occur in the lakes of the barrens while otter are frequent along the coast. While their numbers are not high, all three occur on the Great Northern Peninsula. Weasels and martens are both rare in the province today but once occurred in relatively large numbers throughout the wooded areas of Newfoundland. Arctic hare, now restricted to the extreme northern tip of the Great Northern Peninsula, were once abundant along the west and north coasts of the island (Cameron 1958:75). A gregarious animal, they may occur in large groups in the rocky and open tundra or barrens. Red fox and lynx, two important fur-bearing animals, are found throughout the province in a variety of different habitats. The Newfoundland wolf, which is now extinct, was probably always fairly rare (Cameron 1958). Black bear occur throughout the island. They are generally solitary but may congregate at salmon rivers in the fall or at favourable berry patches. The bears hibernate from late November until late March or April (Northcott 1974).

Finally, arctic fox and polar bears occasionally arrive on ice floes for a brief sojourn on the island. Both have been recorded in the Port au Choix area (Cameron 1958).

While all of these mammals would have been available on the mainland areas adjacent to Port au Choix, only the smaller land mammals would have been found on the Point Riche/Port au Choix peninsula itself (Northcott and Phillips 1976:6).

3.3.6 Avifauna

A large number of bird species are found on the island of Newfoundland or along the coasts either seasonally or on a year round basis (L. Tuck 1967; Threfall 1983). Table 6 lists a number of the species of potential economic importance to the Groswater inhabitants of Phillip's Garden East.

Table 6: Avifauna

COMMON NAME	SCIENTIFIC NAME
loons	*Gavia spp.*
gulls	*Laridae spp.*
common tern	*Sterna hirundo*
arctic tern	*Sterna paradisaea*
Canada goose	*Branta canadensis*
common eider	*Somateria mollissima*
king eider	*Somateria spectabilis*
common murre	*Uria aalge*
thick-billed murre	*Uria lomvia*
common merganser	*Mergus merganser*
red-breasted merganser	*Mergus serrator*
oldsquaw	*Clangula hyemalis*
green-winged teal	*Anas carolinensis*
common goldeneye	*Busephala clangula*
pintail	*Anas acuta*
harlequin duck	*Historionicus historionicus*
wood duck	*Aix sponsa*
black duck	*Anas rubripes*
ringed-neck duck	*Aythya collaris*
willow ptarmigan	*Lagopus lagopus*
bald eagle	*Haliaeetus leucocephalus*

The geographical location of Phillip's Garden East would have permitted the exploitation of a variety of species found in wooded and barren areas and along the coast. Between 20 and 25 species of bird are thought to breed in the Port au Choix area (Northland Associates 1985:89). The peninsula is probably important for the spring and fall migration, especially for seabirds and seaducks but it is a poor stop over or staging area due to relatively limited feeding grounds (Northland Associates 1985:107).

3.3.7 Floral Resources

Edible plants and berries round out the food resources available in the Port au Choix area. Most of the berries ripen between midsummer and early fall. A partial list of these berries is presented in Table 7.

Table 7: Berries

COMMON NAME	SCIENTIFIC NAME
wild strawberry	*Fragaris vesca*
pin cherry	*Prunus pennsylvanica*
chokecherry	*Prunus virginiana*
bakeapple (cloudberry)	*Rubus chamaemorus*
raspberry	*Rubus idaeus*
dewberry	*Rubus pubescens*
blackberry	*Rubus spp.*
crackerberry	*Cornus canadensis*
chuckley pear	*Amelanchier bartramiana*
blueberry	*Vaccinium angustifolium*
marshberry	*Vaccinium macroarpon*
partridge berry	*Vaccinium vitus-idaea*
crowberry	*Empetrum nigrum*

3.3.8 Other Resources

A variety of lithic raw materials, including chalcedony and quartz crystal is available in the immediate site area while good quality chert is found at locales approximately 100 km to the south along the west coast. These materials will be discussed in greater detail in Chapter 5. In addition, the immediate site surroundings would have provided essential fresh water and wood which was certainly used for fuel and almost certainly for construction.

3.4 Implications for the Present Study

Clearly, the local geography and the type of resources available in the immediate site area and surrounding regions have implications for the type of settlement and subsistence strategy used by the prehistoric occupants of Phillip's Garden East.

The standard depiction of the arctic and sub-arctic environment is one of harshness and limited resources. In addition, insular Newfoundland is described as being particularly resource poor in terms of land mammals. Nevertheless, the above review suggests the potential seasonal abundance of a number of major resources. Figures 5 to 8 present a summary of the seasonal availability of these resources.

A number of different settlement/subsistence system adaptations to these resources would have been possible. The resource data suggest that year-round occupation in the Port au Choix area would have been possible with a primary focus on seal and a secondary dependence on caribou and a variety of avifauna, small game and fish. As caribou do not appear to have been available in the immediate Port au Choix area, satellite camps may have been necessary for caribou exploitation. Similar camps may have been used at near-by rivers during the spawning periods for the various anadromous fish species. The procurement of lithic raw material would have required expeditions to or trade with other areas of Newfoundland and, possibly, Labrador. As certain major resources such as seal, caribou, anadromous fish and migratory birds are potentially available in great quantity but only at very limited times of the year, storage would have been an important feature of any successful adaptation to the region.

```
SPECIES                       J  F  M  A  M  J  J  A  S  O  N  D

harp seal                     - - - -////////////              -
harbour seal                  - - - - ---------------------- - - -
hooded seal                   ------/////////////              -
grey seal                                - - - - - - - -
ringed seal                            -------
bearded seal                           -------
walrus                        ? ? ? ? ? ? ? ? ?          ? ? ? ? ?
pilot whale                   ------------------------------------
minke whale                   ------------------------------------
white-sided dolphin                             -------------
Atlantic harbour porpoise                       -------------
```

Figure 5: Seasonal availability of marine mammals

```
SPECIES                       J  F  M  A  M  J  J  A  S  O  N  D

caribou                       //////////--------------------//////
beaver                        -----------------------------------
muskrat                       -----------------------------------
otter                         -----------------------------------
weasel                        -----------------------------------
marten                        -----------------------------------
Arctic hare                   -----------------------------------
red fox                       -----------------------------------
lynx                          -----------------------------------
Newfoundland wolf             -----------------------------------
black bear                    - - - - - ----------//////----- - - -
Arctic fox                         - - - - - - -
polar bear                         - - - - - - -
```

Figure 6: Seasonal availability of land mammals

Availability codes for Figures 4, 5, 6 and 7

```
-----   present
- - -   rare or difficult to access
//////  population aggregate
? ? ?   availability uncertain
```

```
SPECIES                    J  F  M  A  M  J  J  A  S  O  N  D

Atlantic cod                              -------------
Atlantic halibut                           ------------
American plaice                            ------------
winter flounder            ? ? ? ? ? ? ? ? ------- ? ? ? ? ? ? ? ? ?
herring                                 ///////------------------------
capelin                                  ////////////
redfish                                  ---------------
mackeral                                 ---------------
bluefin tuna                             ---------------
American smelt             ? ? ? ? /////////              ? ? ? ? ?
Atlantic salmon            ------------//////-----/////////////--------
brook trout                --------//////---/////-----------//////-----
Arctic char                ------////////----------------/////////----
```

Figure 7: Seasonal availability of marine fishes

```
SPECIES                    J  F  M  A  M  J  J  A  S  O  N  D

gulls                      ------------------------------------------
terns                                    ------------
auks                                    ////////////////////
cormorants                 ---------------------------------------
storm petrels                           ///////////////////
gannets                              ///////////////////
shearwaters                                 --------------
eiders                     - - - - - -                        - - -
murres                     - - - - - -                        - - -
mergansers                 ------------------------------------------
oldsquaw                   -----------                          ---
ducks                      ------------------------------------------
loons                       - - - - - - - - - - ----------- - - - -  - -
geese                      - - - - - ////////------------//////////// - -
ptarmigan                  ------------------------------------------
eagles                     -----------////////------------////////------
```

Figure 8: Seasonal availability of avifauna

The temporal and to some extent spatial incongruity in the availability of critical resources in the Port au Choix area means that Binford's logistically organized subsistence strategy may be one suitable economic adaptation model for the Groswater inhabitants of the site. Binford (1980) distinguished between foraging and collecting as two different hunter-gatherer subsistence strategies. Foragers gather food daily on an "encounter" basis, returning to a base camp each evening. There is no food storage. This system occurs if all the critical resources are available within foraging range of the residential base. The size of the group and the number of residential moves depend on the abundance and concentration of resources. This subsistence pattern results in two settlement types. The residential base is the locale for processing, manufacture and maintenance activities. These residential sites are generally ephemeral and only in cases of site re-use over the years is there significant site build-up. Variability in the contents of residential bases indicates different seasonal scheduling of activities and different durations of occupation. Location sites are the focus for extractive tasks only. Collectors on the other hand are logistically organized, supplying themselves with specific resources through specially organized task groups. Food is stored for at least part of the year. This system is seen as a labour accommodation to an incongruent distribution of critical resources or other conditions which restrict mobility. In addition to the residential base and location site types described above, this system results in field camps which serve as a temporary operation centre for a task group, stations which are used for information gathering and caches for the storage of food supplies and/or equipment. Temporal incongruity in the availability of critical resources may also lead to a storage strategy.

While outlining these two settlement-subsistence systems, Binford (1980:12) acknowledged that there is, in reality, a gradation between these two extremes. In addition, Wiessner notes,

> Environmental variables...can set the bounds within which certain strategies work effectively according to abundance, spatial and temporal distribution, and patterns of variation of resources, but in most environments there are a number of organizational strategies which can fill certain needs. Unless one makes the tenuous assumption that there exists an optimal solution to living in a given environment and that most societies arrive at this solution, it is dubious whether environmental variables can be used to make accurate predictions about organization in prehistoric societies. (Wiessner 1982:176)

The available technology and the established cultural pattern would be additional factors governing the type of economy. Whether the Groswater groups at Phillip's Garden East resided on the peninsula on a year-round basis and used special purpose satellite camps to obtain resources not available in the immediate site area or whether they followed a seasonal round spending different parts of the year in different areas as resources became seasonally and locally available remains to be investigated in subsequent sections of this thesis. In addition, any general settlement-subsistence system model based on resource availability still leaves several options for specific site function. In Chapter 6, this general resource base will be compared with the actual settlement and subsistence data from Phillip's Garden East. Artefactual and ecofactual data from the excavation will be used to investigate whether Phillip's Garden East was a semi-permanent base camp, a special purpose exploitation camp or served some other function. The more general Groswater settlement and subsistence system will be examined in Chapter 7.

Chapter 4
Site Description

4.1 Site Location

The general geography of the site surroundings has been described in the preceding chapter. Here the description will focus on the immediate site area. Phillip's Garden East is situated on the north shore of the Point Riche Peninsula overlooking the Gulf of St. Lawrence. As the name implies, the site is just to the east of the well known Middle Dorset site of Phillip's Garden. While Phillip's Garden is spread over the second and third terraces, Phillip's Garden East appears to be confined to the upper or third terrace. The front edge of this former beach is now approximately 120 m from the present shore line and just over 12 m above the current high water mark.

Today, the terrace is covered with low heath-type vegetation and clumps of shrub and tucamore. Underlying this ground cover is a thick peat deposit of between 10 and 50 cm. Approximately 100 m to the east, this terrace ends in a series of limestone outcrops. To the south, the land begins a gradual rise to the hills at the centre of the peninsula. These hills are covered with almost impenetrable forest and peak at 65 m above sea level. A shallow crease, just after which this rise begins, seems to mark the southern limit of the third terrace and of the site. A dense protrusion of tucamore extends to the edge of the terrace effectively separating Phillip's

Garden East from Phillip's Garden and, at present, this is taken to be the western limit of the site.

The present beach is limestone bedrock and cobble. One large freshwater pond is located just to the east of the site and good streams occur at short distances to both the east (draining this pond) and to the west. At least one shallow cave is found in the hills almost directly to the south of Phillip's Garden East. Several other caves are located around the coast of the two peninsulas. A number of these caves were used for Dorset burials and some of the material recovered from them suggests possible use in earlier times (Brown 1988; Harp 1964).

4.2 The 1984 Investigations at Phillip's Garden East

The first field season of the Port au Choix Archaeology Project was undertaken with three main objectives:

> 1) to assess the large Dorset Eskimo site of Phillip's Garden for potential for future excavation, 2) to survey the area within the park boundaries for historic and prehistoric archaeological sites thus providing the basis for a park development plan, and 3) to look for caves within the park which may have been suitable for Dorset burials. (Renouf 1985b:298)

It was the fulfilment of the second objective that led to the discovery of Phillip's Garden East.

It is rather surprising that the site remained unknown until 1984. Although there are no surface indications of the site, such as the obvious house depressions at Phillip's Garden, the main path from the outskirts of the town of Port au Choix to Phillip's Garden crosses the length of the Phillip's Garden East terrace. The similar locale, and indeed the proximity to Phillip's Garden, suggest this area as one of potential use in prehistoric times. Countless people, including a number of archaeologists, have crossed this terrace over a period of more than 60 years on their way to Phillip's Garden without, apparently, ever discovering the site.

In 1984, the initial test pitting, which resulted in the discovery of Phillip's Garden East, also yielded enough cultural material to argue for a greater investigation of the site. Towards the end of the 1984 season, a four square metre area near the northwest corner of the site was carefully excavated. During this excavation, approximately 70 lithic artefacts and a good sized sample of faunal material were recovered. The lithic component confirmed that Phillip's Garden East was a Groswater site. The combination of the artefact assemblage and the stratigraphy suggested a single component, undisturbed site, while the excellent organic preservation added to the uniqueness of the find. The importance of this new site was noted in the preliminary reports from the initial season of the Port au Choix Project and more intensive investigation at Phillip's Garden East was suggested as an objective to be pursued in subsequent years of the project (Renouf 1985b:304).

No work was undertaken at Phillip's Garden East during the 1985 field season. In the summer of 1986, excavation at Phillip's Garden East was one of several main foci of investigation of the Port au Choix Archaeology Project under the direction of Dr. M.A.P. Renouf (Renouf 1987).

4.3 The 1986 Investigations at Phillip's Garden East

As part of the Port au Choix Project, the work at Phillip's Garden East was one aspect of the overall investigation of the prehistoric occupations of the park area. More specific objectives which guided the excavation included, 1) the development of a fuller definition of Groswater material culture with the recovery of a good lithic sample and the possible recovery of an organic component, 2) an investigation of Groswater culture history, aided by a more complete material culture definition, and 3) an examination of the settlement and subsistence system drawing on faunal material and any other relevant data.

During the summer of 1986, work at Phillip's Garden East was carried out over an eight week period from early June until early August. The crew consisted of five people including the author who acted in the capacity of crew chief.

4.3.1 Methodology

In general terms, the excavation followed a combination of the standards set by Parks Canada (1978) and those of prehistoric archaeology. The Parks Canada system, originally designed for historic sites, was adapted to meet the specific needs of a prehistoric site. Each park area receives a number and letter designation. The Port au Choix National Historic Park is designated 7A. For the Port au Choix Archaeology Project, excavation areas were broken down into 10 m by 10 m operation units each with a number designation. Each operation was then divided into four sub-operations with letter designations. The excavation at Phillip's Garden East occurred in operations/sub-operations 382B, 382C, 383A, 383C and 383D (Figure 9). Excavation units were designated by the co-ordinates of the southwest corner of the square measured in metres from the main datum at Phillip's Garden. The 1986 excavation expanded around the area dug in 1984, making use of the same grid which was, ultimately, tied in with the main grid at Phillip's Garden. A temporary

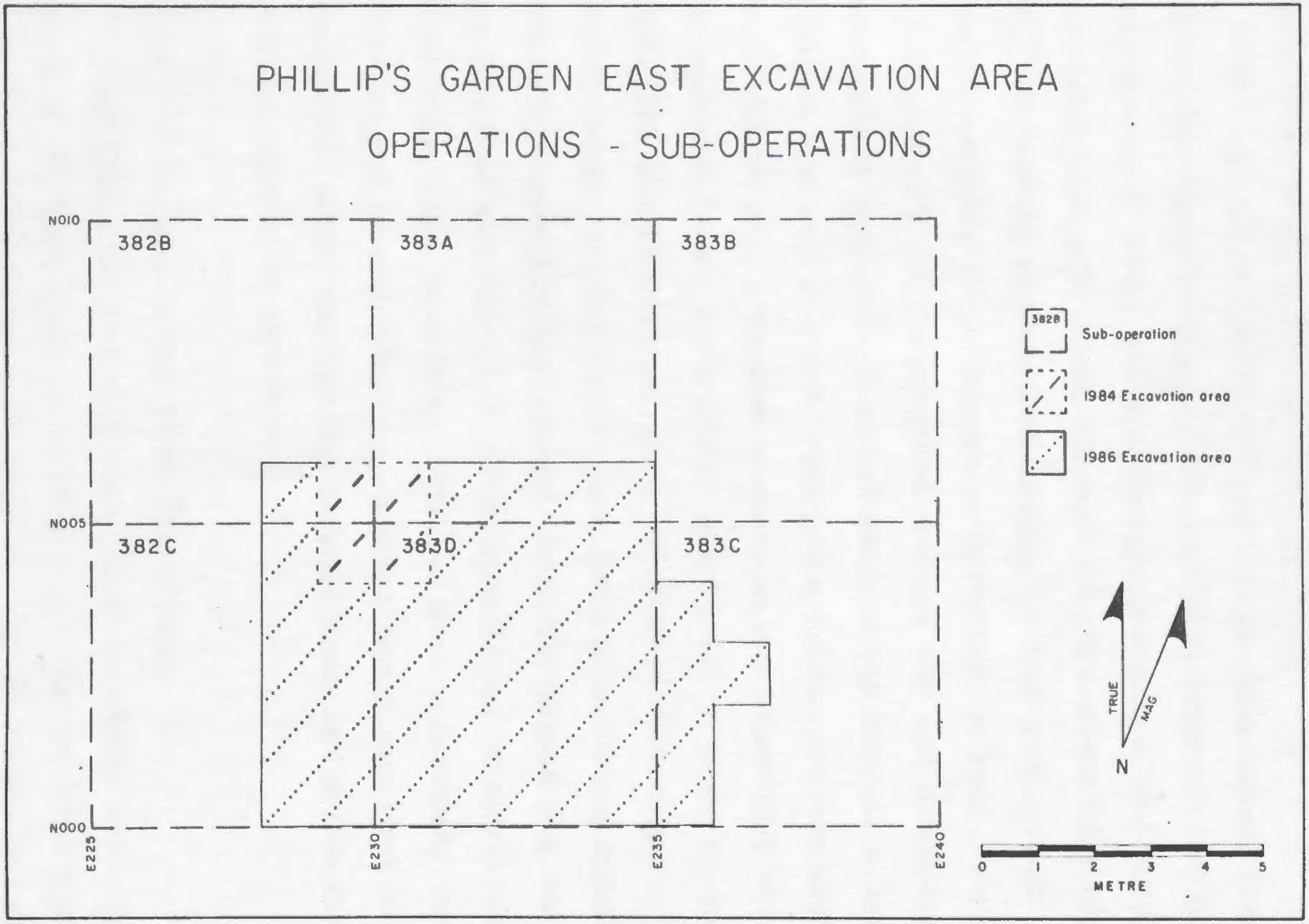


Figure 9: Operations and sub-operations at Phillip's Garden East

Bench mark (12.743 m above sea level) established at Phillip's Garden East in 1986 was also tied in with Phillip's Garden.

The standard excavation unit was the one metre square. Excavation followed the natural stratigraphy, with each level excavated over the entire area whenever possible. Level 1, the upper covering of sod and peat was removed using shovels. Below this level, trowels were the basic excavation tool. All backdirt was screened through 1/4 inch mesh except in areas where faunal material was abundant or in features. In these cases backdirt was bagged and later water-sifted through 1/8 inch screening. The horizontal and vertical position of all artefacts was recorded to the nearest centimetre with reference to the main grid and datum and each artefact was given a lot number. Lot numbers were assigned sequentially within each sub-operation. Debitage and faunal material was collected by one metre square and natural level and given lot numbers accordingly. In cases where a feature occurred within a unit, debitage and faunal material from within the feature were kept distinct. Scientific samples (*e.g.* burned fat) and charcoal samples were given specific lot numbers and their provenience fully described. Features were sequentially numbered, described and photographed. A complete colour and black and white photographic record was kept and included planar and profile shots of all areas and stages of the excavation.

4.3.2 Results of the 1986 Test Pitting

The 1986 field work at Phillip's Garden East began with a systematic survey of the terrace and surrounding area. The two main aims of this survey were 1) to locate good areas for areal excavation and any major features, and 2) to determine the limits of the site. Twenty-five centimetre square shovel tests were dug at approximately 5 m intervals across the main terrace on which the site is situated and in surrounding areas. Initially this work was hindered by the insulating properties of the peat which meant that below a depth of about 15 cm the ground remained solidly frozen, making it impossible to reach the cultural layer. As a result, the process of test pitting extended over a period of several weeks while areal excavation went ahead in an area known to be productive.

In total 71 test pits were dug (Figure 10). Of these, 25 contained cultural material. To the north and south, the site appears to be bounded by the limits of the third terrace. Some cultural material was recovered from test pits dug on the lower terrace immediately to the north of Phillip's Garden East but this material appears to be of Middle Dorset affiliation and to belong to Phillip's Garden. Test pits dug on the rising ground to the south were all sterile. To the east, the site seems to extend approximately 60 m from the excavation area. Shortly beyond this, rugged limestone outcrops begin. At present, the western limit of the site is placed at the intersection of the terrace edge and a protrusion of tuckamore. This tuckamore, which curves around the southwest corner of the site, is virtually impenetrable and did not readily permit test pitting. However, one test pit dug several metres back in this tuckamore did produce cultural material. Given that the Groswater occupation probably occurred before the development of the forest cover on the terrace (as indicated by the stratigraphy, with the cultural layer lying immediately above the limestone beach and overlain by peat), this result is not surprising. However, it does raise the question of where this Groswater occupation ends and the Middle Dorset occupation of this same terrace at Phillip's Garden begins. At present, the site is estimated to cover a total area of 1800 square metres.

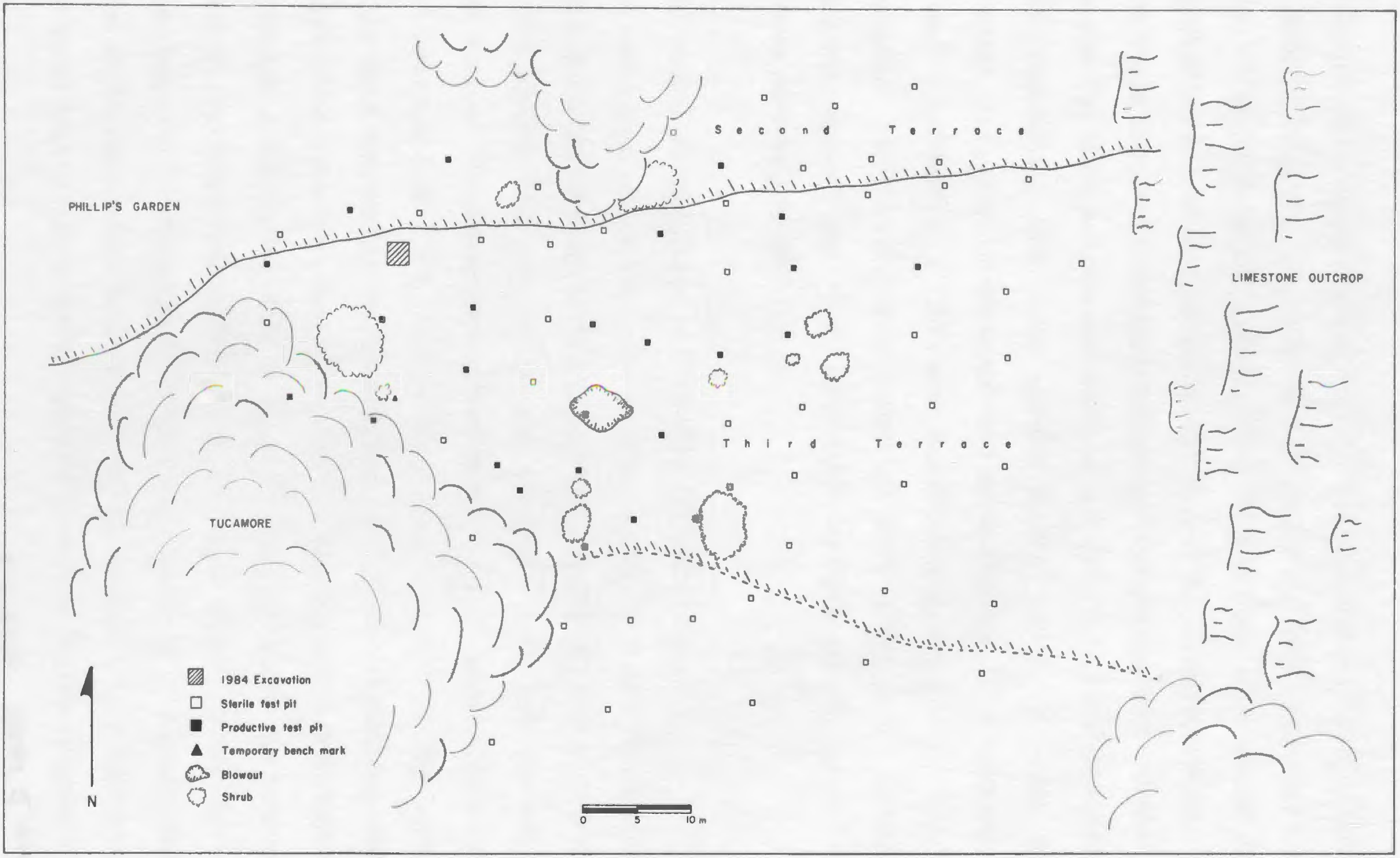


Figure 10: Test pits at Phillip's Garden East

As has already been suggested, due to the delays caused by the frozen ground, test pitting was of less direct use in determining areas for excavation. When it became apparent that it was going to take several days for the ground to thaw after removal of as much of the peat as possible, we decided to begin the areal excavation before the test pitting was completed. We knew that the 1984 excavation had been very productive and decided to begin by expanding this four square metre area. A rich area approximately 15 m to the south-southeast which had also been pinpointed in 1984 and reconfirmed in 1986 was intended as a second location for areal excavation. In the end, time prohibited work in this area; however, test pitting between the main areal excavation and this area suggested that the two were probably contiguous.

4.4 The Areal Excavation at Phillip's Garden East

An areal type excavation was decided upon as it was felt that this would best meet the objectives of the project as outlined above. Initially, an area five metres east-west by six metres north-south was opened up. This total area of 30 square metres included the four square metres that had been excavated in 1984. As Level 1 was removed in this area, it became apparent that we had uncovered half of a circular depression which might represent a house structure. In order to investigate the full extent of this depression, a one metre wide by four metre long trench was extended to the east of the initial excavation area. This trench did indeed uncover the eastern edge of the depression. In total, an additional 17 square metres was added to the excavation area in order to uncover all of the depression. Thus, the areal excavation covered a total of 47 square metres (Figure 11).

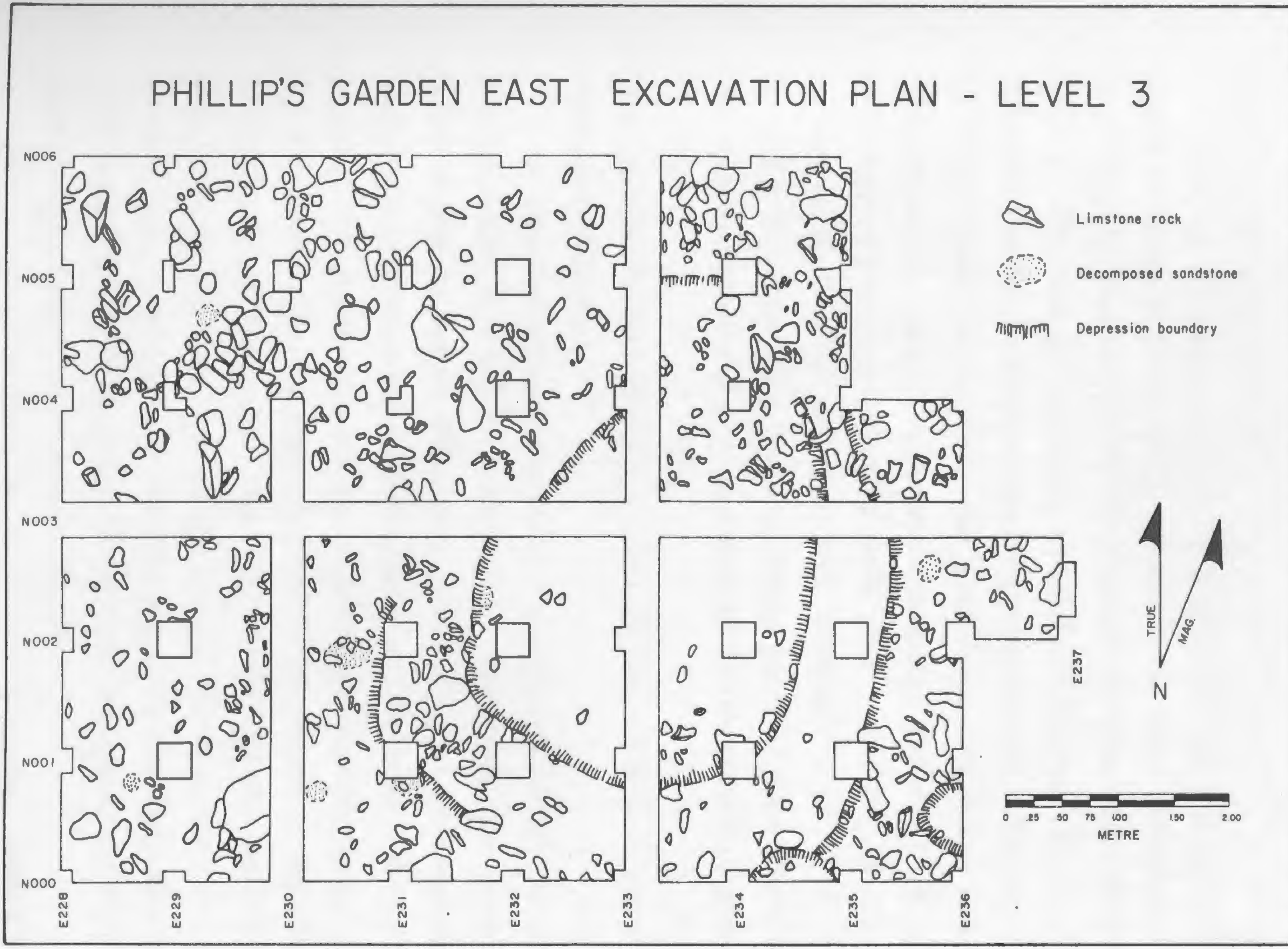


Figure 11: Phillip's Garden East excavation plan

4.4.1 Stratigraphy

The 1984 excavation at Phillip's Garden East had suggested a fairly simple stratigraphy with a single cultural level. This stratigraphy was described as follows (Renouf 1984 fieldnotes) (see Figure 12, Sequence 1):

Level 1 : This was the covering of sod (2-8 cm) and peat (22-28 cm). It was sterile and had accumulated following the occupation of the site.

Level 2 : From 3-6 cm thick, this level was a dark brown soil with extensive organic staining. It contained numerous artefacts, a fair sample of faunal material, fire-cracked rock and a number of charcoal concentrations. This was the cultural level of the site.

Level 3 : An apparent leach zone of mottled grey clay from 2-9 cm thick, this level contained some artefactual material thought to have originated in Level 2.

Level 4 : At the base of the excavation was the sterile sand, gravel and limestone cobble beach.

In 1986, excavation began in the units immediately adjacent to the 1984 excavation area and a seemingly similar stratigraphy was uncovered. However, when excavation shifted to the south end of the excavation area, a much more complex stratigraphy became evident. In most of the southern portion of the excavation, a second, lower cultural layer, designated Level 3A, was present. The soil matrix of this level was similar to that of Level 3, being greasy and clay-like. However, charcoal staining was extensive with the result that Level 3A was usually dark brown or black in colour. Artefact density was high and faunal material was extremely plentiful in most areas. Fire-cracked rock was scattered throughout the level and limestone rock began to emerge in abundance.

Thus, in 1986, five stratigraphic levels, two of them of cultural origin, were recognized. During excavation it became apparent that not all of these levels occurred in all areas of the excavation and that the sequence in which they occurred was variable. As profiles were drawn and analysis undertaken, the true complexity of the stratigraphy began to emerge. In total, the five levels appear to occur in up to seven different sequences; however, four sequences are the most common (Figure 12):

Sequence 1 : Level 1, Level 2, Level 3, and Level 4. (This is the sequence of stratigraphy as originally defined.)

Sequence 2 : Level 1, Level 2, Level 3 (designated Level 3Upper in the excavation), Level 3A, Level 3 (designated Level 3Lower in the excavation), and Level 4.

Sequence 3 : Level 1, Level 2, Level 3A, Level 3(Lower), and Level 4.

Sequence 4 : Level 1, Level 2, Level 3(Upper), Level 4(lens), Level 3A, Level 3(Lower), and Level 4.

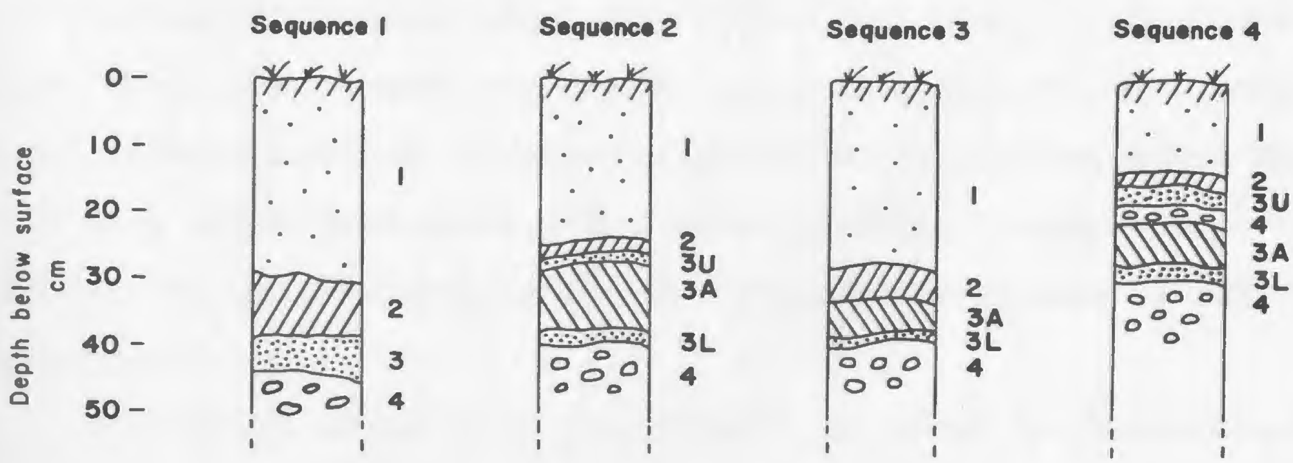


Figure 12: Stratigraphic sequences at Phillips Garden East

The first sequence is present in three main areas of the excavation: 1) adjacent to the north wall of the excavation, 2) within Feature #2, and 3) in the eastern section of the excavation. Along the north wall, Sequence 1 appears to merge with Sequence 3 at approximately N005.00 to N005.50 between E228.00 and E233.00. Within Feature #2, Sequence 1 occurred in the base of the depression. In this area, the stratigraphy was compressed and compacted. In both Levels 2 and 3, artefact density was markedly lower, faunal material rare and fire-cracked rock minimal. Both these levels were flat and smooth with few limestone rocks present. In the extreme eastern section of the excavation, this sequence generally occurred in the area beyond the wall of Feature #2.

Sequence 2 predominated in the southwestern quadrant of the excavation area. It also occurred in most of the wall areas of Feature #2. The occurrence of Level 3A in the eastern section of the excavation was patchy but appears primarily to be associated with the depression wall.

The third sequence appeared in the northwestern quadrant of the excavation and in portions of the wall area of Feature #2. This sequence was not recognized in the initial excavation of this area. In other areas where Level 3A occurred it was usually separated from Level 2 by a fairly sterile, distinct Level 3. In the case of this third sequence, where the intervening Level 3 was absent, it was extremely difficult to separate Level 2 from Level 3A, and indeed impossible before we knew to expect a second cultural level.

The fourth sequence is much more restricted in distribution, occurring only in the extreme southwestern units of the site. It is included here as the sequence, with an upper lens of sterile Level 4, suggests that digging through cultural layers and dumping occurred at the site. The significance of this fact will become apparent below.

The other three sequences appear in very small, isolated patches in the site. They are considered anomalous and of little interpretive value. However, they do provide further evidence for the complexity of the stratigraphy and the mixing of levels.

4.4.1.1 Discussion of Stratigraphy

Fundamental to any explanation of this stratigraphy is the presence of at least two occupational episodes at the site. The first of these resulted in the deposition of the lower cultural layer, Level 3A, over much of the area excavated. In itself, this level may represent a single occupation event or a series of such events. The second occupation is associated with the construction of the house depression, Feature #2 (see below for a full description of this feature), and the deposition of Level 2. As a semi-subterranean structure, the house appears to have been dug through the earlier occupation (Level 3A) with the result that Level 3A was removed from the floor area of the depression. Level 3A remains in the wall area and in much of the surrounding area, especially to the west of the house. Level 3A material from within the house must have been dumped elsewhere during house construction. It may have been used to help build up the wall areas and/or dumped either immediately to the west of the depression or beyond the area excavated.

Level 2 could be the result of a single occupation or of a series of occupations. It was observed that Level 2 within the house was almost totally devoid of artefactual material. Thus, Level 2 outside the house may also represent activity areas which originally occurred outside the dwelling as well as debris from within the house which was dumped outside. Finally, as suggested above, Level 2 outside the house may include material from Level 3A if Level 3A from within Feature #2 was indeed dumped in the area outside the house.

These various possibilities are simply presented here. They will be re-examined later in relation to the features, C-14 dates, and artefacts from the site.

4.4.2 Feature Description

4.4.2.1 Feature #1 - Hearth Area/ Midden

The four square metre area excavated in 1984 (*i.e.* units E229 N004, E229 N005, E230 N004 and E230 NOO5) was designated a hearth feature. The area contained abundant fire-cracked-rock, concentrations of charcoal and bone and numerous artefacts.

When excavation resumed in 1986, this same soil matrix was found to extend to the west, south and east. (No further excavation was done to the north as this would have extended over the edge of the terrace.) This area is no longer interpreted as a discrete feature but rather as part of a large midden covering most of the area excavated (the main exception being the interior of Feature #2 - see below) and certainly extending beyond the excavation area.

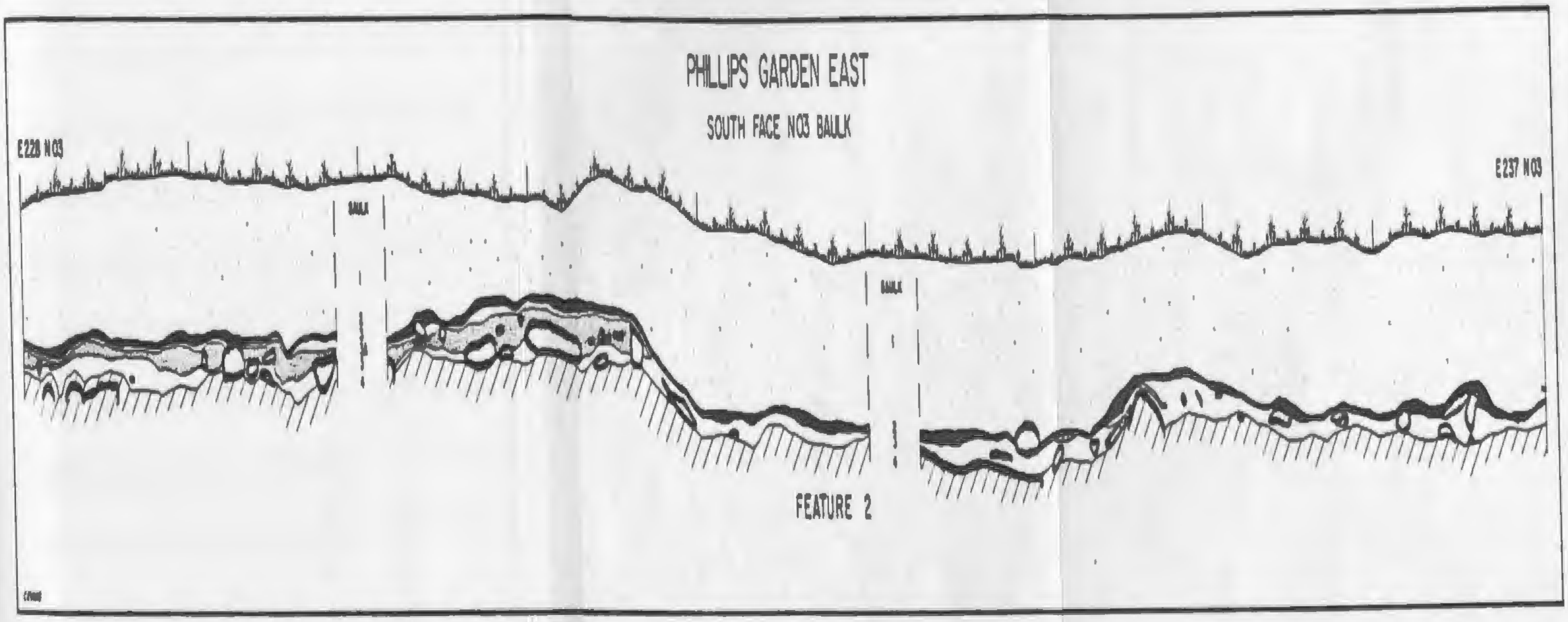
4.4.2.2 Feature #2 - House Depression

Reference to this feature has been made a number of times. The initial excavation area uncovered half of this depression and its presence led to the extension of the excavation area. The depression was roughly circular with an internal diameter of approximately 3.00 m east-west (*i.e.*

from E231.55 to E234.55) and 3.20 m north-south (*i.e.* from N000.55 to N003.75) (see Figure 11). The depression itself had been dug into the ground, with the result that the base of the depression was between 20 cm and 25 cm lower than the extant surface (Figure 13). The floor of the depression was relatively flat, smooth and compacted. A small amount of fire-cracked rock was recovered from within the depression but it was much less extensive than in the areas outside. Artefact and faunal densities were also much lower within the depression (see Appendix C, Figures 26 to 34). In addition, the floor area had been cleared of any large rocks. No evidence of hearths or other features was found within the depression proper even with the removal of the E233 baulk through the centre of the depression at the end of the field season. As has already been noted, the stratigraphy within the depression was of Sequence 1 (*i.e.* Level 1, Level 2, Level 3 and Level 4).

The depression was surrounded by a distinct wall except for a section in the north-northeast. In most areas, this wall formed a low ridge approximately 55 cm to 75 cm across and 5 cm to 10 cm above the living surface surrounding the depression. The walls sloped steeply into the depression and more gently on the external side. Level 3A occurred in most of the wall area (Stratigraphic Sequence 2 or 3). Artefact density was very high and faunal material was plentiful. A number of the organic artefacts were also found in the wall area. Large limestone rocks were common; however, they did not appear to have been carefully placed and were also frequent in the surrounding area. The area in the north-northeast which lacked a clear wall may represent the entrance to the dwelling. Its orientation towards the coast is consistent with the placement of most Palaeo-Eskimo entrance passages. Due to the different stratigraphy and artefact density, the wall area was designated as Feature #2A. A number of discrete features were located within, or overlapping, the wall area. These include Features #5, #7, #9, #10 and #11.

Figure 13: Profile of Feature #2


PHILLIPS GARDEN EAST
SOUTH FACE N03 BAULK
E228 N03
E237 N03
BAULK
BAULK
FEATURE 2

4.4.2.3 Feature #3 - Area of Ash

This feature appeared to be a small concentration of light grey/white ash mixed with decomposing sandstone. A few tiny fragments of calcined bone were found in the feature. Feature #3 was located along the north wall of unit E231 N004 and the south wall of unit E231 N005. It was oval in outline, approximately 30 cm in diameter east-west and 40 cm north-south. The feature was about 4 cm thick and occurred within Level 3.

4.4.2.4 Feature #4 - Bone Concentration

A concentration of bone appeared in Level 2 in unit E228 N003. In general, faunal material was relatively limited in this level and therefore, this concentration appeared anomalous and was designated as a feature. When it first appeared, the concentration was approximately 12 cm in diameter. As excavation continued, this bone was found to continue into Level 3 and to extend throughout the unit. It is likely that this bone concentration as it appeared in Level 2 is merely an upward extension of the typical concentration of faunal material found in Level 3/3A and should not be considered a true feature.

4.4.2.5 Feature #5 - Flake Concentration

Feature #5 was an area along the north wall of E231 N001 and south wall of E231 N002 which contained a large number of tiny retouch flakes of white chalcedony (see Chapter 5 for a description of this material). This feature occurred in Level 2 within the wall of the depression (Feature #2A). Artefact density in this whole area was high and, as there was no soil difference between Feature #5 and the surrounding area, it was extremely difficult to define the exact boundaries of the feature. Given this, the feature is thought to extend from N001.73 to N002.16 (43 cm north-south) and from E231.15 to E231.85 (70 cm east-west). It should be noted that most of the material from this feature occurred in the upper part of the wall. The extension of this feature into the depression proper is probably the result of material having washed down the steep interior slope of the wall.

4.4.2.6 Feature #6 - Area of Chert Chunks

This feature was unique in being a small area of Cow Head chert chunks which appeared to have been subjected to heating. Several of these chunks were fused into underlying limestone rocks. The chunks were shattered and none showed signs of deliberate flake scars. Feature #6 occurred in unit E229 N000, Level 2 and was 22 cm across at its widest and about 7 cm thick.

4.4.2.7 Feature #7 - Bone Concentration

Appearing in the wall slope of Feature #2 in unit E232 N001, this bone concentration is probably similar to Feature #4 in being an extension of faunal material from one level into another. The bone first appeared in Level 2 in the interior part of the depression where Level 3A was absent and faunal material generally rare. As excavation continued, this concentration merged with the faunal material in Level 3A as it occurred in the wall. The extension of this bone material into Level 2 could be due to material having washed down the wall slope.

4.4.2.8 Feature #8 - Flake Concentration

Located in Level 3A of unit E228 N001, this feature was a small concentration of large Cow Head chert flakes and a few artefacts. As was true for the other flake concentrations, there was no difference in soil or any other indication of a feature beyond the apparent concentration. The feature was roughly 15 cm across at its maximum and 5 cm thick.

4.4.2.9 Feature #9 - Bone Concentration in Box-Pit

A roughly square pit formed by a number of irregularly placed rocks occurred within Feature #2A in unit E231 N000, Levels 3A and 3L. The pit was between 40 cm and 45 cm across and up to 8 cm deep. It contained a large quantity of faunal material including a number of large seal long bones and several cranial fragments. A small concentration of chert flakes, 6 cm across and one cm thick also occurred within this feature. This flake concentration was designated Feature #9A.

4.4.2.10 Feature #10 - Bone Concentration in Circular Pit

Another bone concentration occurred in Feature #2A. Feature #10 was located in Level 3A, unit E231 N002. In this case, the pit was much less well made and roughly circular in outline. The pit was 17 cm by 24 cm across and 16 cm deep. A small piece of whale bone appeared near the top of the pit and faunal material within the pit was extensive.

4.4.2.11 Feature #11 - Flake Concentration

This feature also occurred in the wall of the house (Feature #2A). The feature was a roughly circular depression within a larger, shallow depression along the south wall of unit E234 N000 in Level 3A. It contained a large number of green Cow Head chert flakes as well as several microblades. The feature measured 23 cm east-west and 16 cm north-south although it almost certainly extended beyond the southern limit of the excavation. The depression was up to 19 cm deep.

4.4.3 Discussion of Features

Feature #2 is clearly a house depression but further interpretation of this structure remains difficult. The absence of storage or hearth features and the small amount of artefactual and faunal material from within the depression make interpretations of seasonality impossible. In addition, semi-subterranean houses have not been reported from other Groswater sites making the presence of such a structure at Phillip's Garden East somewhat anomalous. These issues will be discussed in more detail in Chapters 6 and 7.

Feature #5 is the only feature which clearly represents a specific activity. The large number of tiny flakes from a single lithic type indicates a tool finishing or resharpening event. However, it is not possible to determine whether this feature represents the actual activity locale or a dumping episode.

Taken together, the other features suggest a palimpsest of activity areas and/or dumping episodes but provide little specific information on the nature of these events.

4.4.4 Radiocarbon Dates

While charcoal staining was extensive in Levels 2, 3 and 3A over most of the excavation area, discrete concentrations of charcoal suitable for standard radiocarbon dating were relatively rare. In total, eight carbon-14 dates were obtained from Phillip's Garden East charcoal samples, one from the 1984 excavation, the others from 1986 (Table 8).

A more detailed consideration of these dates in relation to stratigraphy and artefact styles will be presented in subsequent sections. At present, some general comments are in order. The date of 2660+/-70 B.P., obtained in 1984, fit well with the expectation that Phillip's Garden East was a Groswater site. Four of the dates obtained in 1986, covering the period from *ca.* 2700 B.P. to *ca.* 2300 B.P., also fit comfortably within the Groswater phase time period as it is presently defined (*ca.* 2800-2100 B.P.). The three dates of 1930+/-140 B.P., 1910+/-150 B.P. and 1730+/-200 B.P. were not expected and appear anomalous as they are at least two centuries more recent than what has generally been considered the terminal date for Groswater. In addition, they occur within a time period which has been interpreted as a distinct gap between the end of the Groswater occupation of the island (*ca.* 2100 B.P.) and the beginning of the Middle Dorset occupation at *ca.* 1800 B.P. (*cf.* Auger n.d.; Tuck n.d.).

Table 8: Radiocarbon dates from Phillip's Garden East

LAB NUMBER	LOT NUMBER	PROVENIENCE	LEVEL	FEATURE	DATE[2]
Beta 23980	7A383D0475	E232 N002	3	2	1730+/-200
Beta 19088	7A383D0555	E231 N004	3A	-	1910+/-150
Beta 19085	7A382C0066	E229 N003	2	-	1930+/-140
Beta 19087	7A383D0539	E230 N000	3A	-	2320+/-100
Beta 19089	7A383D0613	E232 N000	3A	2A	2370+/-160
Beta 19086	7A383D0403	E232 N004	3	-	2510+/-90
Beta 15375	7A382B0002	E229 N005	3	-	2660+/-70
Beta 23979	7A383D0371	E230 N003	3	-	2760+/-90

2 All dates are in radiocarbon years B.P. (1950). A radiocarbon half-life of 5568 years was used. No corrections for DeVries effect, reservoir effect or isotope fractionation were made.

These three dates from Phillip's Garden East can be interpreted in a number of ways. The dates can simply be rejected as they do not fit with our present understanding of chronology. However, the provenience and possible sources of contamination for all charcoal samples were carefully noted during excavation and there is no apparent reason to suspect contamination of these particular samples. If we accept the dates, a number of interpretations are still possible. The dates may be used to argue for a prolongation of the Groswater phase into more recent times or an extension of the Middle Dorset occupation to an earlier date. Alternatively, the dates may be seen to be associated with an as yet unidentified intermediate phase between Groswater and Middle Dorset in Newfoundland. (To date, there is no recognized Early Dorset occupation on the island.) Any of these latter interpretations would necessitate a re-thinking of our current understanding of Palaeo-Eskimo culture history in Newfoundland and Labrador. These alternatives are simply presented here. They will be considered with other data from the site in Chapter 6 and in relation to other Groswater data in Chapter 7. It should also be emphasized that all these dates have large +/- factors which could place them close to the accepted end date for Groswater of 2100 B.P. or within the accepted dates for the Middle Dorset occupation beginning at *ca.* 1800 B.P. Finally, all radiocarbon dates must be treated with some caution.

4.5 Summary and Discussion

The stratigraphy, features and radiocarbon dates from the areal excavation at Phillip's Garden East have been described and to some extent discussed in the preceding sections. In concluding this chapter, these various sources of information will be considered together. When the features and dates are combined with the stratigraphy, an interpretation of the events represented in the small area excavated at Phillip's Garden East becomes truly complex.

The presence of at least two occupation events at the site is indicated by the stratigraphy (cultural levels 2 and 3A). The radiocarbon dates suggest a series of occupations over an eight hundred to one thousand year period from *ca*. 2700 to 1700 B.P. Trying to match the dates with the stratigraphy is difficult as there is no regular correlation between the two sets of data. Table 8 indicates that both the earliest and latest dates for the occupation came from Level 3. However, using our knowledge of the stratigraphy as it occurred in various areas of the site (see above) and examining the dates in relation to these areas as well as to stratigraphic level permits a manipulation of the data to form a more logical sequence. In this hypothesis, Level 2 would be dated at *ca*. 1900 B.P. The 1930+/-140 B.P. date from Level 2 would be accepted as is. The 1730+/-200 B.P. date came from Level 3 at the base of the house depression. As there was no Level 3A in this area, the date is clearly associated with Feature #2 and given the argument presented above, by extension it is associated with the Level 2 occupation. The 1910+/-150 B.P. date attributed to Level 3A is anomalous and should probably be attributed to Level 2. This date came from an area of the site where the stratigraphy was extremely compressed, where there was no clear differentiation between Level 2 and Level 3A and where there was evidence for disturbance. The charcoal sample was closely associated with two fragments from a rectangular soapstone vessel (see Chapter 5.3.3.10) which appears out of place in the clearly Groswater Level 3A. The five dates ranging from 2320+/-100 B.P. to 2760+/-90 B.P. are probably all associated with the Level 3A occupation. Three of these dates are attributed to Level 3 but all of these are from areas where Level 3A was not originally recognized.

The very high artefact density and large quantity of faunal material from Level 3A suggest an intensive occupation event over a long period of time or a series of such events. The carbon-14 dates argue for the latter interpretation. Level 2 remains somewhat of an enigma. The house depression (Feature #2) is certainly associated with the deposition of Level 2. However, the amount of admixture of earlier, Level 3A material in Level 2 and the actual date of this upper occupation remain uncertain. These issues will be returned to in Chapter 6 when they will be considered in relation to the artefactual material recovered from the excavation.

Chapter 5
Artefact Description and Analysis

5.1 Introduction

The artefact assemblage from Phillip's Garden East provides important new insights into the material culture of the Groswater Palaeo-Eskimo phase. Particularly significant in this regard is the organic component of the assemblage; however, the lithic artefacts also serve to enhance our understanding of Groswater. This chapter will present a detailed description of the artefact assemblage and some initial analysis. More comprehensive analysis, drawing on the artefacts and other data will be presented in Chapters 6 and 7.

The material considered in this chapter will be limited to that obtained from the main excavation area during the 1984 and 1986 field seasons. Very few artefacts were recovered from the numerous test pits dug at Phillip's Garden East and less precise provenience data on this material makes it of minimal use in analysis. The main excavation at Phillip's Garden East yielded a total of 1420 artefacts (Table 9) and an additional 15,777 pieces of lithic debitage[3].

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[3]This does not include the debitage from the 1984 excavation.

Table 9: Artefact distribution by class

ARTEFACT CLASS	NUMBER	FREQUENCY
blades/microblades	633	44.57
utilized/retouched flakes	159	11.97
endblades	149	10.49
unidentifiable biface fragments	121	8.52
endscrapers	91	6.40
cores	82	5.77
burin-like-tools	46	3.24
knives	34	2.39
preforms	20	1.41
sideblades	14	0.99
perforators	8	0.56
tip-flute spalls	5	0.35
ridge flakes	3	0.21
burin/burin-like-tools spalls	2	0.14
adzes	10	0.70
tabular ground slate	4	0.28
unidentified ground slate fragments	7	0.49
stone vessels	3	0.21
unidentified stone object	1	0.07
pendant	1	0.07
harpoon heads	6	0.42
flaking punches	5	0.35
unidentified organic artefacts	16	1.13
total	**1420**	**100.73**

5.2 General Methodology

It is well recognized that any attempt at classification and typology in archaeology is fraught with dangers. Numerous ethnographic and ethno-archaeological studies have shown that the archaeologist's functional and/or morphological types may show little correspondence with the functionally or morphologically significant attributes of the tool as envisioned by the tool maker or user (*cf*. Ebert 1979; Haland 1977; Heider 1967; Gould

1980). Nevertheless, the construction of a typology remains fundamental to all archaeological interpretation as it is the one way of organizing large sets of data in analytical units. The typology constructed below is done with the aim of permitting such an analysis.

As is the case with many culture areas, Palaeo-Eskimo artefact typology has suffered from a lack of consistency in definition and application. The present thesis will follow, in general terms, the pseudo-functional artefact classes recognized by most arctic archaeologists. Unfortunately, due to the relatively recent definition of the Groswater Palaeo-Eskimo phase, there are few comprehensive descriptions of Groswater assemblages. In addition, as the total definition of Groswater material culture remains incomplete, new variability appears in each new collection. Attributes used in the description and analysis of the present assemblage have been drawn from the work of a number of Palaeo-Eskimo researchers (*cf.* McGhee 1981; Maxwell 1985; Taylor 1968) with special reliance on the existing analyses of Groswater material (*cf.* Auger n.d., 1982, 1986; Fitzhugh 1972, 1976a, 1976b; Loring and Cox 1986; Sawicki n.d.). An attempt has been made to follow, where they exist, standards for the identification, description and evaluation of these metric and non-metric attributes. However, as will be apparent below, certain changes to the developing Groswater typology were deemed appropriate for the analysis of the Phillip's Garden East material. A complete description of the attributes used in the present thesis appears in Appendix A.

5.3 Lithic Artefacts

5.3.1 Methodology

The lithic component from Phillip's Garden East has been divided into three main groups for the following analysis. The first group consists primarily of functional tool classes: endblades, sideblades, knives, burin-like-tools, scrapers, adzes and vessel fragments. Biface fragments and several ground slate objects of unknown function are included in this group as they clearly represent finished tools. Microblades/blades are also included although only a small proportion show evidence of deliberate modification or even expedient use. It should be emphasized that we cannot always be certain of the uses to which these tools were actually put and that the boundaries between certain of these classes are not always clear-cut. Finally, preforms are included with the specific artefact class to which they belong.

The second group includes by-products of the manufacturing sequence, although in some cases these artefacts were used as expedient tools. Cores, blanks, retouched and/or utilized flakes, flake perforators, burin and burin-like-tool spalls, tip-flute spalls, ridge flakes and debitage all fall into this group. Description here will be much more cursory.

The final lithic group consists of potential raw material recovered from the site but lacking evidence of deliberate human alteration. This group includes quartz crystals, chert chunks and a variety of slate and shale pieces.

Detailed description and analysis will focus on the functional tool classes of the first group outlined above. In cases where artefact classes are small or where there is significant variation, individual artefacts will be described. In larger classes, artefacts will be grouped into representative forms, the characteristics of which will be described in general. Individual descriptions for endblades, sideblades, knives, burin-like-tools, scrapers and microblades/blades are presented in tabular form in Appendix B.

The term "class" is used in its generally accepted sense of a grouping of forms usually in which function is inferred. The use of the term "type" is generally avoided in the present thesis due to the plethora of definitions and the lack of consistency in use. Instead, artefact classes are divided into groups and, upon occasion, sub-groups. These groups and sub-groups serve to identify artefacts sharing a number of similar attributes. They may or may not represent functionally or temporally significant differences within the artefact class.

5.3.2 Lithic Raw Material

Before beginning the actual artefact descriptions, a discussion of the raw materials used in the Groswater lithic assemblage is in order as reference to these materials will be made throughout the following sections.

Groswater collections from Labrador, where the phase was first defined, have been described as distinctive on the basis of the predominant use of fine-grained colourful cherts for the chipped stone industry (Fitzhugh 1972). These cherts were rare or absent in other collections from Labrador. Research into lithic source areas has suggested that this material originated in the chert bearing beds along the west coast of Newfoundland (Nagle n.d.a, n.d.b, 1986). However, these sources were used by a number of Palaeo-Eskimo groups on the island, with the result that Groswater sites in Newfoundland do not appear to be immediately distinctive on the basis of raw material alone.

In trying to obtain a clearer understanding of lithic raw material use patterns among different groups in Newfoundland, several attempts have been made to isolate specific chert types in the material from the west coast. At Factory Cove, Auger (n.d.:67) noted that the Groswater collection was "made mostly from those vari-colored silicates loosely termed Cow Head cherts". Within this group, Auger (n.d.:67) distinguished between black, brown, green, blue, grey, red, beige, light green, yellow, and "flint" varieties, the latter being described as a "high quality , semi-translucent raw material." These distinctions were used to discuss apparent differences in the "type" of chert used for different tool classes.

Nagle (1986:100) has discussed the "extensive chert bearing Ordovician deposits extending from the tip of the Great Northern Peninsula south along the west coast to Port au Port" and goes on to state that

> ...*visually identical* cherts are the dominant lithologies in Newfoundland Dorset collections from the west coast, particularly from Port au Choix, and from the sites at Factory Cove and Cow Head where chert outcrops have been actively worked. (Emphasis mine)

However, in a more detailed publication, Nagle (n.d.a:108-110) distinguished amongst three different sources of chert in western Newfoundland. The first of these, located at Cow Head, contains material described as lustrous, opaque, very fine grained and of several colours, often mottled or banded. The second locale, at Factory Cove, contains lustrous, opaque, fine grained cherts ranging in colour from very dark brown to almost black. The third chert type is from an as yet unknown source although the Port au Port Peninsula is presented as the most likely area. This chert is described as lustrous, opaque, fine grained and chocolate brown, green, tan, grey or mottled in colour. According to Nagle (n.d.a:110) it is this latter chert type which is typical of Groswater collections and he designates it "Groswater Dorset chert".

Finally, in her analysis of the Broom Point Palaeo-Eskimo collection, Krol (n.d.:105-115) identified 19 raw material types, most of them varieties of cherts. Among others, she distinguished between "Opaque Cow Head chert", "Translucent Cow Head chert", and "Grey-green chert". The "Grey-green chert" was described as the predominant lithic raw material used in the presumed Groswater component[4] at the site (Krol n.d.:111).

In attempting to apply these types of distinctions to the material from Phillip's Garden East, a number of problems were encountered, some related to ambiguities in terminology, others of a more fundamental nature.

Nagle's (n.d.a:108) distinction between Factory Cove and Cow Head as two discrete locales seems rather tenuous given the close geographical proximity of these outcrops and their presence within the same geological formation. More confusing is Nagle's (n.d.a:110) assertion that typical Groswater material comes from a third source. He suggests that the material from the Cape Ray Light site is typical of the "Groswater Dorset chert" type. While a Groswater component is now recognized in the mixed Cape Ray Light site, the majority of the material from this site is of Middle

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[4] The artefacts from Broom Point designated by Krol (n.d.) as Groswater are very few in number and none are clearly diagnostic of the phase in my opinion. However, they do not appear to fit comfortably in the Middle Dorset assemblage. In addition, several dates from the site suggest a Groswater occupation (see Chapter 7.3.2.2 and Table 32).

Dorset affiliation. Furthermore, Factory Cove itself is a Groswater site. Thus, the term "Groswater Dorset chert" as used by Nagle (n.d.a, n.d.b, 1986) and other Labrador researchers (*cf.* Fitzhugh 1980a:26) appears to be a misnomer, at least in relation to Newfoundland Palaeo-Eskimo sites.

The use of colour terminology is also confusing. While many chert "types" have been distinguished on the basis of colour, no systematic colour terminology has been used although such terminology does exist in geology in a form similar to the Munsell soil colour charts with which most archaeologists are familiar. As a result, it is not possible to replicate or compare the various divisions that have been made by different authors.

Further hampering such distinctions are the effects of surface weathering and burning, both of which occur frequently on archaeological chert specimens. Weathering and heat may alter the colour and even the chemical compostion of the chert (Leudtke 1978) making the typing and sourcing of archaeological chert samples even more difficult.

A more fundamental problem is the validity of distinguishing chert "types" on the basis of colour. The raw material loosely called chert by archaeologists is primarily formed by a process of silica replacement in pre-existing lithologies. The colour of the chert is determined by the colour of the original lithology (*e.g.* green shale, grey limestone etc.), the presence of impurities or trace minerals (*e.g.* hematite, pyrite etc.), and the degree of silica replacement. By definition, cherts contain over 80 percent silica. The closer the silica content approaches 100 percent and the fewer impurities, the more translucent the chert (Blatt, Middleton and Murray 1972:531-538). The factors which govern the colour of the pre-existing lithology, the extent and type of impurities present and the degree of silica replacement are such as to permit extremely localized patterns of variation with the result that visually distinctive cherts may derive from contiguous beds while visually similar cherts may derive from sources at some distance from each other. Thus, cherts of many colours and degrees of translucency are found within the Cow Head beds and, generally, they cannot be distinguished from other cherts from the west coast of Newfoundland solely on the basis of a visual inspection (Jack Botsford, personal communication 1987).

A representative sample of the lithic raw material from Phillip's Garden East was examined by Jack Botsford of the Geology Department, Memorial University of Newfoundland. Based on a visual inspection, he concluded that the vast majority of the chert in this collection *could* have originated in the Cow Head beds.

Grouped together, these cherts are extremely variable in colour, banding, mottling, and translucency. In general terms, as is true for all cherts, they are micro- to crypto-crystalline in structure with a high silica content. The Cow Head cherts were formed by a process of biogenic silica replacement during the Cambrian and Ordovician. As such, they can be distinguished from the earlier Precambrian Ramah chert series by the presence of microfossils, especially radiolaria. These tiny one-celled organisms appear as light or dark spheres in the chert and are often visible to the naked eye or with a hand lens. Another related characteristic of the Cow Head cherts is their formation in a deep water environment which results in patterns of banding and mottling (Botsford, personal communication, 1987). Without thin-sectioning and chemical analysis, we cannot be certain that the fine grained vari-coloured cherts in the Phillip's Garden East collection originated in the Cow Head beds. However, they almost certainly came from the west coast of Newfoundland and Cow Head is both a possible and logical source. Henceforth, these cherts will be collectively referred to as Cow Head chert. However, more work is clearly required before we will be able to correlate these archaeological lithic types with specific geographical source areas.

In addition to this Cow Head chert, the Phillip's Garden East collection did contain two additional visually distinctive cherts that can validly be considered different. The first of these is Ramah chert. Ramah chert is clear to light grey in colour with occasional black mottling, micro-crystalline, granular in texture and has a sub-vitreous lustre (Fitzhugh 1972:40-45). Since the only known source for Ramah chert is in northern Labrador, we can also be certain that this material represented an exotic item for the inhabitants of the site.

The other distinctive chert type is white to light tan or light blue in colour. It contains abundant vugs or cavities with concentric infilling of crystal silica as well as numerous pisolites, both visible to the naked eye. In contrast to the Cow Head cherts, formation probably occurred in shallow water with silica replacement in limestone. Geologically, this type of formation is possible in the Port au Choix area (see Chapter 3.2.2) and a local source for this material seems likely (Botsford, personal communication, 1987). Although the term chalcedony is one which also suffers from ambiguous use in archaeology, it is the most appropriate one to describe this material and will be used here.

The remainder of the lithic assemblage from Phillip's Garden East is composed of quartz crystal, a variety of slates, shales and siltstones with varying degrees of silicification, sandstone and soapstone. Quartz crystal is known to occur in the limestone bedrock of the Port au Choix area. Specific sources for the other materials listed above are unknown. These materials will be described in greater detail in relation to the specific artefacts into which they were fashioned.

5.3.3 Artefact Description

5.3.3.1 Endblades (Plates 7,8,9)

The endblades from Phillip's Garden East represent a significant proportion of the finished tools in the assemblage (see Table 9). A total of 149 complete or partial endblades was recovered. Side-notched endblades, so typical of all Groswater assemblages, dominate this class; however, a large number of unnotched endblades was also recovered. This variability prohibits any meaningful generalization in the endblade description. Side-notched and unnotched endblades will be considered separately in the following description. The unnotched group is extremely variable and an attempt to recognize discrete sub-groups has been made. A summary of the metric attributes for all the endblades is presented in Table 10.

Table 10: Summary of metric attributes for endblades

	N	RANGE	MEDIAN	MEAN	STAND. DEV.
LENGTH	35	21.72 - 53.40	37.56	34.79	8.46
WIDTH	65	9.12 - 25.00	17.06	16.56	3.58
THICKNESS	78	2.26 - 7.34	4.80	4.17	1.12

i) Side-notched endblades (Plate 7:A-V): Eighty complete or fragmentary endblades can be assigned to this form. In general terms, these endblades are characterized by triangular to lanceolate shaped blades with slightly convex to straight lateral edges. Bases are straight to very slightly concave and usually have some ventral thinning and a steep dorsal bevel. Transverse cross-sections are plano-convex. By definition, all are side-notched. Side-notches are well made, usually symmetrical and occur singly on each lateral edge. They are variable in both width and depth. A summary of the metric attributes of the endblades in this group is presented in Table 11. All of the side-notched endblades are made of colourful Cow Head chert with the exception of one small blade of Ramah chert.

Table 11: Summary of metric attributes for side-notched endblades

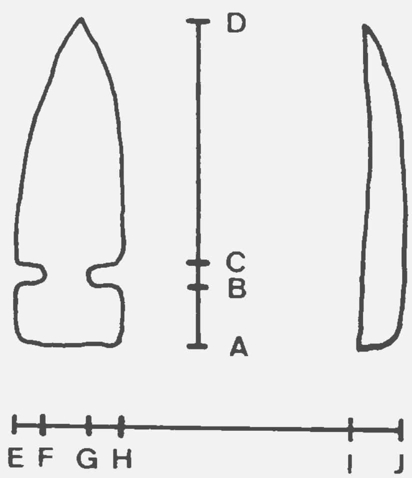
	N	RANGE	MEDIAN	MEAN	STAND. DEV.
LENGTH	21	21.72 - 53.40	37.56	33.10	7.30
WIDTH	44	9.12 - 21.88	15.50	15.75	3.21
THICKNESS	53	2.26 - 10.06	6.16	4.08	1.10

Traditionally, Groswater side-notched endblades have been grouped on the basis of two criteria used independently or in unison: 1) overall length and 2) notch height. In terms of overall length, Fitzhugh (1972:126) distinguished between small (*ca.* 20 mm in length), medium (*ca.* 30 mm) and large (*ca.* 50 mm) varieties. In the Factory Cove endblade analysis, Auger (n.d.:83) plotted length distributions and also obtained three clusters (24 mm, 30 mm and 34 mm). However, Auger's three length clusters do not correspond to Fitzhugh's groups except in the case of the middle size. In addition, Auger noted that

> ...we cannot see any major attribute differences from one length cluster to another, except that an endblade averaging 34 mm long has wider and deeper notches that one averaging 24 mm long (Auger n.d.:83).

In terms of notch height, distinction is made between low and high side-notches, the latter, usually in combination with large size, resulting in so-called "box-based" points. In the collection from Factory Cove, Auger (n.d.:82) noted six endblades with an average notch height (see Figure 14) of 8.7 mm. These endblades were considered to be high side-notched while 66 examples with an average notch height of 4.4 mm were included in the low side-notch group. In other collections, the distinction between low and high side-notches has also been made, apparently on the basis of a visual inspection as no metrics are given (*cf.* Fitzhugh 1972:126).

The side-notched endblades from Phillip's Garden East were examined from a number of perspectives with the aim of identifying valid sub-groups. Endblades were grouped by visual inspection as well as by metrical examination of overall length, absolute notch height and notch height as a percentage of overall length (Figure 14). Results of the metrical examinations are presented in Figures 15, 16, 17 and 18. In general, the results obtained were contradictory.



A-D Length
A-B Notch height
B-C Notch width
E-H Width
F-G Stem width
G-H Notch depth
I-J Thickness

Figure 14: Sketch of a typical Groswater side-notched endblade

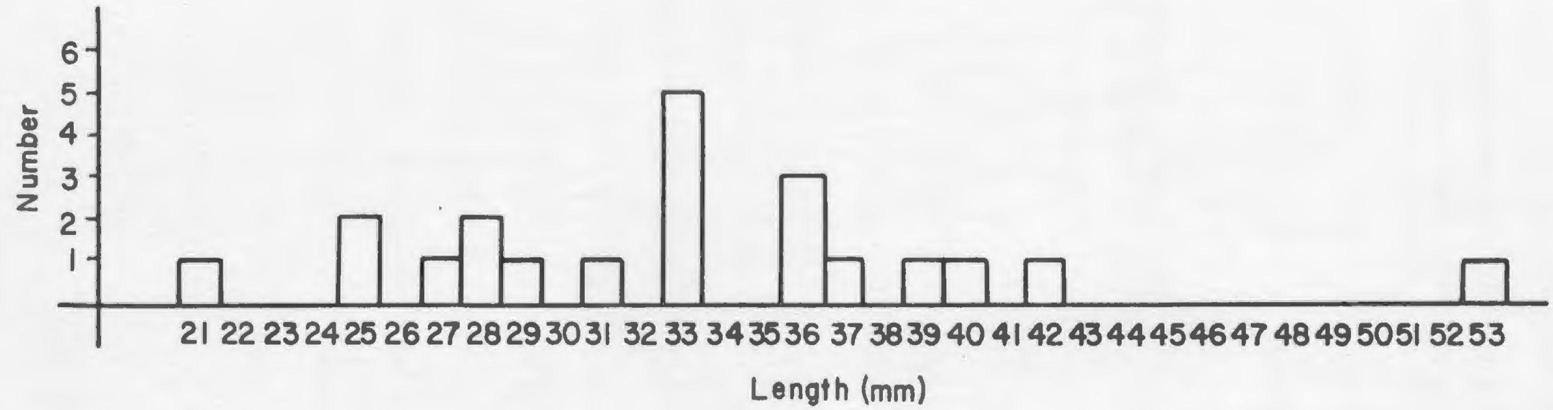


Figure 15: Overall length of side-notched endblades

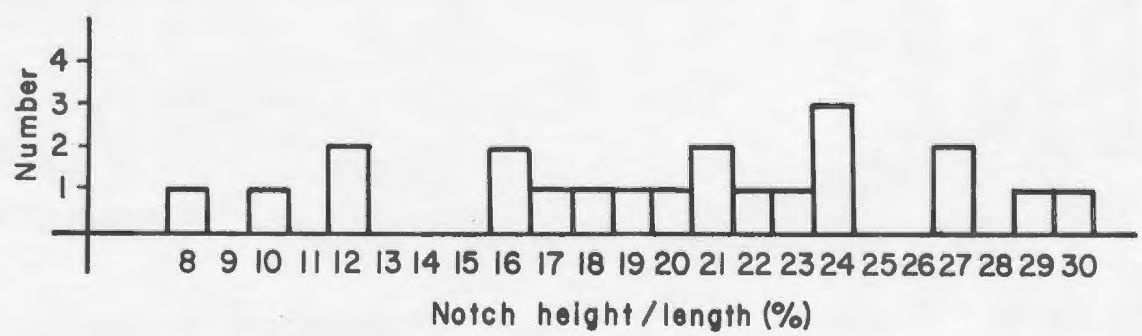


Figure 16: Notch height:length of side-notched endblades

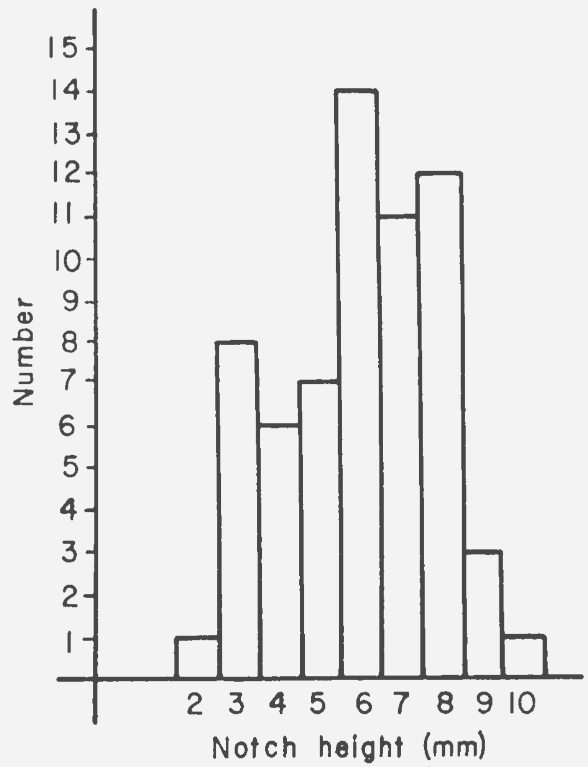


Figure 17: Notch height of side-notched endblades

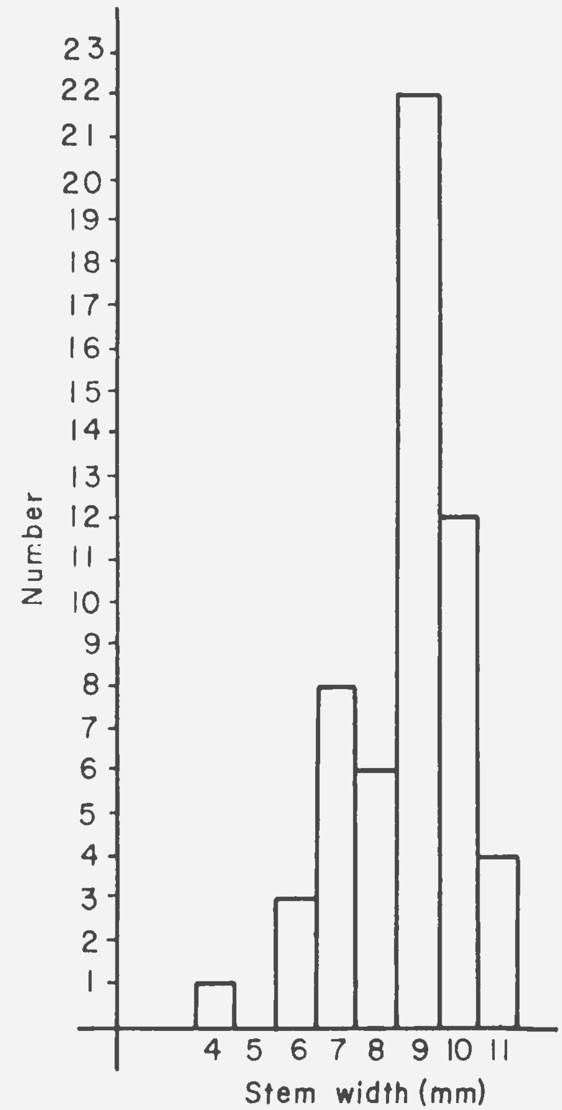


Figure 18: Stem width of side-notched endblades

Overall length of the side-notched endblades was extremely variable (Figure 15). This variation is also apparent in both the range and standard deviation calculations (Table 11). It was not possible to divide the collection into small, medium and large varieties. Furthermore, any peaks that did occur in the distribution did not correlate with peaks obtained for the material from Factory Cove (Auger n.d.:Table XI) or from the Groswater Bay sites. It should be noted that the small sample of only 21 complete side-notched endblades may limit the usefulness of these results. In addition, Fitzhugh (1972:126) suggested that the small, medium and large sized endblades he identified in the Groswater Bay sites were used for arrows, sealing harpoons and walrus hunting harpoons respectively. If we accept this hypothesis, an alternate interpretation of the Phillip's Garden East side-notched endblades is possible. From Figure 15, it is clear that the smallest (21 mm) and largest (53 mm) side-notched endblades are somewhat anomalous in the collection. All of the other side-notched endblades could be considered to be of the medium size with a peak at 33 mm. If we accept Fitzhugh's functional argument, the Phillip's Garden East assemblage would thus contain a preponderance of sealing harpoon points with only a single arrow point and a single walrus hunting point. Obviously, this has implications for site function and this issue will be returned to in Chapter 6 in association with the faunal data from the site.

A visual inspection was then used to divide the endblades into low and high notch groups. This was accomplished fairly easily with only a few endblades remaining in an intermediate position. However, it was felt that a more objective approach to the question of low versus high side-notches was desirable. Notch height was calculated as a percentage of overall endblade length (Figure 16). Once again, sample size is small but the resulting distribution suggests three clusters with 13 of the 21 endblades falling into the intermediate group, a result at odds with the traditional low-high dichotomy. Absolute notch height was then calculated and plotted (Figure 17). The sample size here is much larger with 64 notched bases available for measurement. The resulting distribution is a tight unimodal curve with a peak at 6 mm, a value between Auger's (n.d.:82) 4.4 mm and 8.7 mm values for low and high side-notches. Once again, the Phillip's Garden East distribution does not permit a distinction between low and high side-notches.

Taken together, these results suggest that the side-notched endblades from Phillip's Garden East cannot be divided into sub-groups using existing methods. The results also point to the need for a more careful examination of two factors affecting endblade morphology: 1) hafting modification, and 2) tool resharpening.

The results presented above indicate remarkably little variation in notch height, especially when compared with the wide range of overall endblade lengths and notch height to length ratios. What seems to have been of primary concern morphologically to the makers of Groswater side-notched endblades was the hafting modification.

This tight constraint on the hafting element is also evident in the calculation of stem width (see Figure 14). For the 56 endblades available for measurement, stem widths cluster around 9 mm (Figure 18).

During the excavation of Phillip's Garden East, the first Groswater bone artefacts were recovered and this small sample included one harpoon head obviously made for hafting with a side-notched endblade (see below for a full description of this harpoon head). About 20 cm away, two side-notched endblades were recovered, one of which fit perfectly with this harpoon head. During analysis, when the similarity in notch heights became evident, the relationship between the side-notched endblades from the site and this one harpoon head was examined more closely. Of the 64 complete or base sections of side-notched endblades, 28 (43.75 percent) could easily have been hafted with this harpoon head on the basis of notch height and stem width. In other dimensions (overall length, notch height to length and blade width) these endblades were extremely variable.

Archaeologists and ethnographers have long recognized that, for the skilled, fashioning stone tools is far easier and faster than forming the bone, antler or ivory handles, harpoon heads, shafts or other objects to which the stone tools were hafted (Keeley 1982). Thus, it is reasonable to expect that the attributes related to the hafting of stone tools would be of greatest concern to the flint knapper and that the type of haft would constrain variability in these attributes.

In addition, archaeological and ethnographic studies have also shown that tool resharpening may significantly alter blade form on tools such as endblades. Overall endblade length differences may, therefore, reflect differences in tool resharpening and use histories rather than functionally or morphologically significant artefact types. (See Simpson n.d.:146ff. for a similar discussion of endblade morphology.) Given these considerations and the results obtained from the visual and metrical examinations of the side-notched endblades from Phillip's Garden East, no further sub-division of this material was attempted.

ii) Unnotched endblades (Plate 8): The unnotched endblades from Phillip's Garden East are also extremely variable. This group includes 10 complete examples and an additional 23 which are complete enough to permit description. These endblades have been divided into three groups. Due to the variability and small size of these groups, no general descriptions or overall metrics can be presented.

a) Triangular, concave based endblades (Plate 8:H-L): Eight endblades have been included in this category, only two of which are complete. In general, these endblades are triangular in outline with straight to slightly convex lateral edges. Bases are concave and usually have been bifacially thinned. Two have been tip-fluted on the ventral surface. A third example (Plate 8:I) is a small, essentially unaltered flake, the proximal end of which has been bifacially flaked to produce a concave base. Edge retouch is minimal on this example. Transverse cross-sections are biconvex and, more rarely, plano-convex. An additional two endblades appear to belong to this category; however, they are missing sections of their bases and lateral edges making positive assignation difficult. All of these endblades are of Cow Head chert.

Table 12: Summary of metric attributes for triangular, concave based endblades

	N[5]	RANGE	MEDIAN	MEAN	STAND. DEV.
LENGTH	3	28.18 - 36.72	-	-	-
WIDTH	4	12.48 - 21.88	-	-	-
THICKNESS	5	2.86 - 5.40	-	-	-

b) Triangular, straight based endblades (Plate 8:A-G): This group includes 4 complete and 12 incomplete examples. General characteristics include triangular to lanceolate shaped blades with straight to slightly convex lateral edges. Bases are straight and most show some ventral thinning and dorsal bevelling. All are plano-convex in transverse cross-

[5] In cases where the sample size (N) is less than 10, only the range is given.

section. These characteristics give then an appearance similar to many of the side-notched endblades in the collection, an observation which will be investigated below (see Chapter 7.2.1.1). One of these endblades (Plate 8:G) is tip-fluted on the dorsal surface and another has a small area of grinding on the dorsal surface near the base. All are of Cow Head chert.

Table 13: Summary of metric attributes for triangular, straight based endblades

	N	RANGE	MEDIAN	MEAN	STAND. DEV.
LENGTH	5	33.26 - 50.72	-	-	-
WIDTH	8	11.58 - 22.68	-	-	-
THICKNESS	10	3.14 - 5.46	4.30	3.99	0.78

c) Miscellaneous (Plate 9): Nine artefacts are included in this category. One small point (Plate 9:A) has a deep concave base which appears to be dorsally bevelled. The ventral surface is partially ground. Three other points are leaf-shaped with convex bases and convex lateral edges. One of these (Plate 9:E) has a rounded tip while in a second example (Plate 9:D), the lateral edges straighten near the tip to form a sharp point. The third leaf-shaped point (Plate 9:C) is represented by a base section only. Two other bases in this group (Plate 9:G,H) appear to be from thick triangular points. They have straight to slightly concave bases which are dorsally bevelled, and plano-convex cross-sections. Another endblade (Plate 9:F) is an irregular lanceolate shaped point with an almost circular transverse cross-section near the tip. This tip is suggestive of use as either a drill or an awl; however, no use wear indicative of such use was evident under low magnification. One small flake (Plate 9:B) has been unifacially retouched along both lateral edges to form a triangular blade. The proximal end of this endblade remains unmodified and retains a large bulb of percussion. The final endblade in this group (Plate 9:I) is a preform. It is triangular in outline, fully retouched and has been tip-fluted but is still very thick, especially at the proximal end. Studies of the tip-fluting process suggest that an endblade preform is reduced to an appropriate shape and thickness, often involving tip-fluting, before the base is prepared (Simpson n.d.:143-144). All of the endblades in this group are of Cow Head chert.

Table 14: Summary of metric attributes for miscellaneous endblades

	N	RANGE	MEDIAN	MEAN	STAND.DEV.
LENGTH	6	24.84 - 50.32	-	-	-
WIDTH	7	13.76 - 25.00	-	-	-
THICKNESS	8	3.12 - 7.34	-	-	-

iii) Unidentified endblade fragments: Six blade midsections and 26 blade tips are considered to be from endblades on the basis of size and edge symmetry; however, they are too incomplete to place in any of the above categories. One of the blade tips may have been tip-fluted on the ventral surface. Two tips are of Ramah chert; the rest of the fragments are of Cow Head chert.

5.3.3.2 Sideblades (Plate 10)

A total of 14 artefacts were identified as belonging to this class. This is a small sample with considerable size variation (Table 15). All of the sideblades are of Cow Head chert. Four are too fragmentary for description. The remaining 10 sideblades can be divided into three groups.

Table 15: Summary of metric attributes for sideblades

	N	RANGE	MEDIAN	MEAN	STAND. DEV.
LENGTH	8	18.22 - 27.64	-	-	-
WIDTH	9	11.08 - 27.64	-	-	-
THICKNESS	11	1.88 - 5.20	3.54	2.89	0.92

i) Ovate (Plate 10:A-H): The eight sideblades in this group all have an ovate shape and generally symmetric lateral ledges. Specific variations include one sideblade with bulging lateral edges and sharp points at both ends and a second which has an irregular hook-shaped point at one end.

ii) Semi-lunate (Plate 10:I): One sideblade fits into this group. One lateral edge is convex; the opposite edge is concavo-convex.

iii) Triangular (Plate 10:J): This final sideblade has an irregular outline which is roughly triangular. Chipping is much less careful than on the other sideblades and this example may be unfinished.

5.3.3.3 Knives (Plate 11)

Knives are a generally recognized artefact class in Palaeo-Eskimo collections, although in some collections they have been grouped in a general biface class or combined with certain endblades. Identifying knives in Groswater collections is not always easy. When fragmentary, endblades, burin-like-tool bases and knives, as well as the preforms from which they were made, may all be confused. In addition, numerous biface fragments, especially blade tips, cannot be ascribed to any specific class. Such fragments will be considered as a group of "unidentifiable biface fragments" in a subsequent section.

In general, knives were distinguished from endblades on the basis of larger size and asymmetric blade shape. While hafting modification is a characteristic of most Groswater tool classes, knives usually have small, shallow, low side or corner notches which are often asymmetric. These characteristics aided in separating knife bases from endblade bases but made the distinction between knife and burin-like-tool bases more difficult.

Given these considerations, 34 knives were recognized in the collection. Consistent with the data from other Groswater sites, the knives from Phillip's Garden East exhibit a great deal of variability, permitting little generalization. Overall lengths are between an estimated 35 mm and over 65 mm, while widths vary from 13 mm to 42 mm (Table 16). Blade shapes are also extremely variable. This variability does not permit the recognition of discrete forms, and may largely be due to differential use and re-sharpening. In addition to the general knife characteristics outlined above, other more specific observations are in order.

Table 16: Summary of metric attributes for knives

	N	RANGE	MEDIAN	MEAN	STAND. DEV.
LENGTH	9	37.22 - 66.04	-	-	-
WIDTH	15	13.40 - 42.20	27.80	24.09	7.83
THICKNESS	18	2.66 - 5.40	4.03	4.38	0.75.

Two of the knives (Plate 11:A,B) stand out immediately due to extensive grinding. The smaller example is almost totally ground on both surfaces and along both lateral edges. In the case of the larger example, the grinding is restricted to the blade but is also extensive. In both cases the left lateral or back edge is thicker, with a marked dorsal bevel, while the right or working edge is much thinner and has a small ventral bevel.

These artefacts are, in many respects, similar to burin-like-tools and Auger (n.d.:76 and Plate IV:H) has classified a similar tool as a triangular burin-like-tool. They are also somewhat analogous to Maxwell's burin-like knives. Found originally at the Nanook site (Maxwell 1973), and common in core area Early Dorset assemblages, these implements are described as being of fine-grained chalcedony, completely polished and having one very sharp unibeveled edge (Maxwell 1985:144, 176 and Figures 6.12 and 6.13). While little evidence of use was apparent, under 200x magnification Maxwell observed meat fibers in the polishing grooves. Thus, the Nanook burin-like knife is interpreted as a meat slicing knife (Maxwell 1985:176). The two examples from Phillip's Garden East show greater affinity with the knives from the site than with the burin-like-tools. These artefacts are tentatively included as knives with the recognition that this may well be a prime example to the archaeologists' pseudo-functional artefact class bearing little relationship to the actual use of the tool or the functional category to which it was ascribed by its maker and user. Grinding occurs on three other knives, but it occupies only a very small proportion of the surface and is in no way comparable to the extensive grinding of these two knives.

The remaining knives show considerable variation in flaking from quite crude to very fine with several of the knives being among the most carefully flaked artefacts in the collection, including one with finely serrated edges.

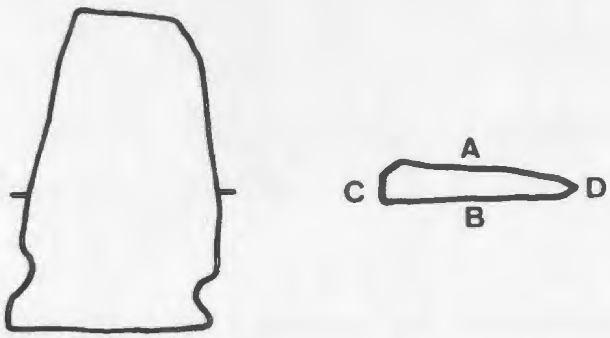
All of the knives from Phillip's Garden East are made from Cow Head chert with a considerable colour range represented.

5.3.3.4 Burin-Like-Tools (Plate 12)

The class of artefacts known as burin-like-tools, pseudo-burins, or gravers is such that some general comment is required before beginning the description of the specific burin-like-tools from Phillip's Garden East.

During the long Palaeo-Eskimo sequence, there is a gradual transition from true spalled burins to ground burin-like-tools. Consistent with the position of Groswater at the end of the Early Palaeo-Eskimo tradition, assemblages from this phase often contain a few spalled burins; however, the ground burin-like-tool predominates.

Auger (n.d.:72-74) provides a good description of the typical Groswater burin-like-tool which will be re-iterated here in part as it is useful for describing the general characteristics of the burin-like-tools from Phillip's Garden East. In the manufacturing process, burin-like-tools were first chipped to their intended form. This process included the shaping of the blade, the production of distinctive edges and some type of hafting modification, usually side or corner notches. The burin-like-tool was then ground. The extent of grinding was variable, in some cases largely restricted to the ventral and dorsal surfaces while in others, the entire blade was ground. In all cases, the end result was two distinctive lateral edges. The thickest edge, assumed to be the back, had a steep dorsal bevel, usually formed by two ground facets. This edge would, presumably, have rested against the haft. The opposite edge, considered the working edge, was thinner and bifacially bevelled with one or more facets on each surface. The distal end was also bifacially bevelled and usually formed a sharp corner where it met the working edge. Many of the burin-like-tools exhibit use-wear in the form of flaking at this corner and along the distal portion of the working edge.



A - ventral surface

B - dorsal surface

C - back edge

D - working edge

Figure 19: Sketch and cross-section of a typical Groswater burin-like-tool

The final area for general comment is the question of siding or "handedness" of burin-like-tools. Auger (n.d.:74) suggests the following approach:

> Generally speaking the cross section of a burin-like-tool is trapezoidal...; the right and left hand sides may be determined by placing the burin-like-tool with the proximal end closer to the analyst while the artifact lies on its longest face (the longest face of the trapezoid when the artifact is seen in cross section).

Auger (n.d.) then divides the burin-like-tools on the basis of whether the working edge is on the right or the left lateral edge. Giddings (1964:218), in his description of burins in the Denbigh Flint complex, went a step further and called a burin with its working edge on the right side a left-handed burin. This additional step seems both confusing and unwarranted and will not be used here.

No true spalled burins were found at the site. A total of 46 burin-like-tools was recovered from Phillip's Garden East. Only six of these are complete. A summary of the metric attributes for the burin-like-tools is presented in Table 17.

Table 17: Summary of metric attributes for burin-like-tools

	N	RANGE	MEDIAN	MEAN	STAND. DEV.
LENGTH	6	17.26 - 25.93	-	-	-
WIDTH	10	14.24 - 21.54	17.89	17.33	2.42
THICKNESS	13	2.38 - 4.38	3.38	3.45	0.61

Three burin-like-tool groupings are identifiable:

i) Rectangular (Plate 12:A-H): Four complete burin-like-tools and 14 blade sections are included in this group. The blade shape is roughly rectangular with a definite distal end. Lateral edges usually expand slightly towards the base resulting in right-angled or slightly obtuse distal corners. All but one of the rectangular burin-like-tools have their working edge on the right lateral edge as defined above. The amount of grinding is variable from almost complete with only small areas of use-wear flaking on the working edge to limited grinding confined to the dorsal and ventral surfaces. All of the complete examples exhibit hafting modification in the form of irregular shallow side or corner notches on both lateral edges.

An additional blade section (Plate 12:H) appears to be a preform of a rectangular burin-like-tool. The edges have been carefully flaked to produce the characteristic bevels of a burin-like-tool including a distinctive dorsally bevelled back edge and a thinner bifacially bevelled working edge. However, there is no grinding on the piece, suggesting an unfinished condition. This artefact helps to confirm the manufacturing process outlined above.

ii) Triangular (Plate 12:I,J): This second form is represented by two complete burin-like-tools and one blade fragment. In this group, the blade shape is triangular with the working edge at right angles to the base, the back edge at a 45 degree angle and a slightly rounded distal end. Grinding is extensive on both of the complete examples and includes the base on the smaller of the two. All three show use-wear flaking along the working edge. Hafting modification in the form of bi-lateral, single, shallow, side/corner notches occurs on both complete examples. All have their working edge on the right side.

This form is in some ways analogous to Auger's (n.d.:75) "windswept" type especially as illustrated in Plate IV:D of his thesis. However, none of the burin-like-tools from Phillip's Garden East has the pronounced concave back edge of this type. At present, the difference seems to warrant the designation of a different group.

iii) Angled Tip (Plate 12:K): A single blade section falls into the angled tip burin-like-tool group. The lateral edges of this blade converge towards the tip but a distinct distal end remains and forms an acute angle with the back edge. The working edge appears to be on the right side.

iv) Burin-like-tool fragments: An additional 23 burin-like-tool fragments are too incomplete to be placed in any of the above groups. Of these, eight are bases with bilateral side or corner notches. Seven of these have their working edge on the right side while one is on the left side. One corner fragment is unique in being extremely well worked with perfectly symmetric, bifacial bevels on the two finished edges present which form a sharp right angle. The other pieces are too fragmentary to permit any meaningful description.

All of the burin-like-tools from Phillip's Garden East are made of vari-coloured Cow Head cherts. It should be noted that none is made from the distinctive dark green nephrite characteristic of later Middle Dorset burin-like-tools.

5.3.3.5 Unidentifiable Biface Fragments

After other classifications, 116 biface fragments remained that could not be placed in other classes with any degree of assurance. They will be considered in three groups.

i) Blade Tips: Forty-three blade tips could belong to either knives, endblades or sideblades. Nine are plano-convex in cross-section, 33 biconvex and one irregular. One of the former is unifacially flaked while a second is made on a blade with minimal edge retouch and no surface retouch. Two of the blade tips show small areas of surface grinding. All are of Cow Head chert except for one of Ramah chert and one of chalcedony.

ii) Bases: Due to various forms of hafting modification, base fragments were generally easier to place in a specific bifacial tool class than blade fragments and therefore the number of unidentifiable base fragments is much lower. Nineteen biface bases could belong to either knives, endblades or burin-like-tools. Of these, 7 are plano-convex and 12 biconvex or irregular in cross-section. Base shape varies with 15 straight, 3 concave and one irregular convex. Six of these bases show evidence of hafting modification in the form of side or corner notches. Two have small areas of grinding on one surface. All base fragments are of Cow Head chert.

iii) Other: The remaining biface fragments include 5 blade midsections and 51 edge or corner fragments of Cow Head chert. One of the mid-sections is heavily burned with numerous pot-lid fractures.

5.3.3.6 Endscrapers (Plates 13, 14, 15)

Palaeo-Eskimo artefact typology has been plagued by a lack of consistency and this is especially true for scrapers. Badgley (1978, cited in Auger n.d.:63) has noted that 11 different names have been used by as many authors referring to seemingly the same type of scraper. As Simpson (n.d.:150) has noted with reference to Dorset material,

> Researchers in general assume overall size, working edge shape, corner shape, and overall form to have functional implications and have devised typologies based on these attributes. These typologies are, however, in the end only descriptive and in no cases of which I am aware have convincing arguments been presented to link specific functions to differently shaped Dorset end scrapers. Indeed, in the absence of such techniques as microscopic use wear analysis, any explanation of the observed variability in terms of function will remain inadequate. Further, exclusive use of shape to organize scrapers into types ignores the variability present in lateral edge and basal treatment, variability which requires some sort of explanation.

In Groswater Palaeo-Eskimo collections, endscrapers described as eared or as having pronounced graving spurs have been considered a particularly diagnostic artefact (*cf.* Fitzhugh 1972:126). In recent analyses of collections containing Groswater material, a number of different scraper types have been described. Loring and Cox (1986:74) in their analysis of the Postville material describe a "roughly rectangular (scraper) with an expanded or eared distal end" as being the most common scraper type, with parallel sided, stemmed and endscrapers-on-blades also occurring. Auger (n.d.:87-88) recognized eight types of scrapers in the Factory Cove material but confined his description to the four main types: 1) triangular, 2) flared, 3) on flake, and 4) with expanded corners. Sawicki (n.d.:166-

167) in describing scrapers from Palaeo-Eskimo sites in the Bonavista Bay region of Newfoundland which included Groswater components distinguished between endscrapers with expanded corners and those with graving spurs. Expanded corner endscrapers as defined by Sawicki correspond to Auger's flared endscrapers, while her scrapers with graving spurs appear the same as Auger's expanded corner type, resulting in a rather confusing terminology.

In examining the scrapers from Phillip's Garden East, it was felt that the distinction between "expanded corners" and "graving spurs" (as used in Sawicki's sense) was arbitrary. Furthermore, some of the scrapers from Phillip's Garden East had an "expanded corner" on one lateral edge and a "graving spur" on the other, making placement in one or the other of these groups impossible. The validity of the term "graving spur" is also questionable. While the corners of these scrapers would certainly have been suited for a graving function, to my knowledge, no use-wear studies have been undertaken to support such an interpretation. It is suggested here that the characteristic Groswater "graving spurs" are simply the by-product of two interacting variables: 1) the extent of hafting modification, and 2) the extent of working edge resharpening. "Graving spurs" will occur on scrapers with a constricted stem or side-notched hafting modification and working edge exhaustion (Figure 20). Thus, the Groswater endscraper analysis presented here follows, to a large extent, the etiological approach used by Simpson (n.d.) for his Dorset and, to a lesser extent, Groswater endscraper analysis.

Only a small percentage of the endscrapers from Phillip's Garden East exhibit what would generally be identified as hafting modification in the sense of an obvious stem or side/corner notches. Virtually all of the scrapers do show signs of bifacial or unifacial lateral edge retouch and/or utilization and many have been basally thinned, especially when a pronounced bulb of percussion remained on the flake blank from which the scraper was fashioned. It is possible that the lateral edges were used as scraping edges but they lack the careful fine retouch and snub-nosed appearance typical of the obvious working edges. Such modification may also be undertaken to remove irregularities which, in the case of hand-held tools, would prove awkward or even dangerous. In the case of the material from Phillip's Garden East, the lateral edge retouch and basal thinning is more profitably considered as a form of hafting modification. Unfortunately, no scraper hafts were found in the small organic sample from the site. Furthermore, without detailed use-wear studies, it is not possible to determine whether or not a haft was actually used on such objects (*cf.* Keeley 1982). Nevertheless, this suggestion will be retained as a working hypothesis.

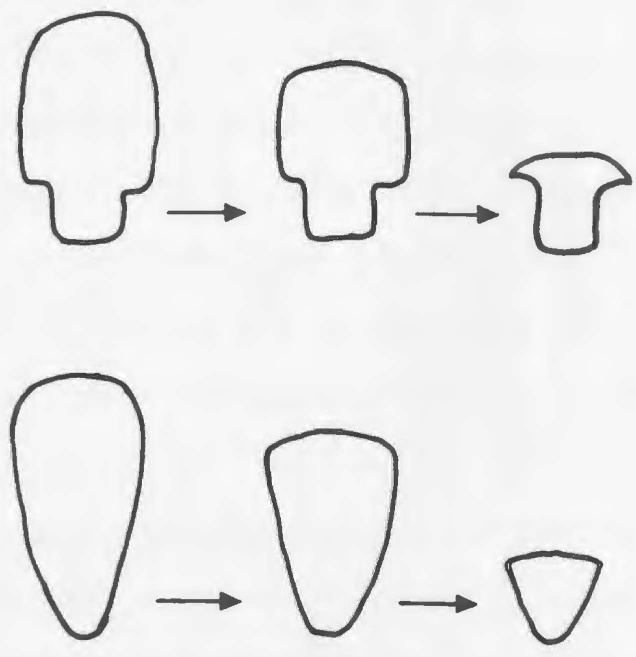


Figure 20: Proposed etiological development of Palaeo-Eskimo endscraper forms (after Simpson n.d.:Fig. 7)

Given these considerations, the 91 endscrapers from Phillip's Garden East have been divided into three main groups. A summary of the metric attributes for all the endscrapers is presented in Table 18.

Table 18: Summary of metric attributes for endscrapers

	N	RANGE	MEDIAN	MEAN	STAND. DEV.
LENGTH	72	13.48 - 45.00	29.24	25.70	6.16
WIDTH	80	13.88 - 37.86	25.87	24.36	5.46
THICKNESS	88	2.76 - 10.96	6.86	5.66	1.57

i) Rectangular Endscrapers: This is the largest group of scrapers in the collection and includes 51 examples. The category includes endscrapers that have been classified by other researchers as rectangular, expanded corner, flaring, and with graving spurs. In the present analysis, this group has been sub-divided on the basis of hafting modification.

a) Straight-sided rectangular endscrapers (Plate 13): This sub-group includes scrapers with parallel, slightly expanding straight or slightly convex lateral edges and those with definite parallel sided stems. In total, 29 examples are considered to belong to this group. Bases are usually straight to slightly convex and 20 exhibit some degree of basal thinning. Only eight can truly be called stemmed. However, all exhibit some amount of lateral edge retouch. This retouch may be unifacial or bifacial and may occur on one or both lateral edges. A visual inspection suggested that many of the stemmed scrapers had the same base shape and general dimensions as the unstemmed endscrapers. The basal sections of the flakes on which the endscrapers were made would have been modified to a greater or lesser extent depending on their size in relation to the haft for which they were intended, following the argument presented above that it is easier to modify the stone tool than the organic haft. In addition, any one scraping job may exhaust a number of scrapers in which case a new scraper may be attached to the old haft. Thus, scrapers which were close in size to the haft would only have required minimal edge retouch and perhaps basal thinning to be fitted into a jam type haft while larger ones would have required greater reduction, resulting in the development of a stem, the working portion having been left at its maximum width. Both the stemmed and unstemmed scrapers of this general shape would probably have been hafted and used in the same way.

Table 19: Summary of metric attributes for straight-sided rectangular endscrapers

	N	RANGE	MEDIAN	MEAN	STAND. DEV.
LENGTH	25	17.48 - 36.08	26.78	25.82	5.39
WIDTH	27	18.32 - 37.86	28.09	26.82	5.00
THICKNESS	29	3.54 - 8.74	6.14	5.95	1.37

Working edge shapes are convex and usually symmetric with only a few showing bevelling to one side or the other. In all cases, the working edge angle is steep and most could be called snub-nosed. The junction between the working edge and the lateral edges usually creates a sharp angle or corner resulting in the so-called "expanded corners" or "graving spurs". All but two of these scrapers appear to be exhausted as overall length is small and the working edge usually joins with what is considered to be the hafted portion of the scraper.

One well made stemmed example (Plate 13:I) is of Ramah chert. The other scrapers in this group are of Cow Head chert.

b) Concave-sided/side-notched rectangular endscrapers (Plate 14:A-I): In general, the 17 scrapers in this group share many attributes with the straight-sided rectangular scrapers described above. The scraper outline is roughly rectangular. Working edges are convex, usually symmetric and have a steep working edge angle. Bases are straight to slightly convex and on 13 of these scrapers there is some basal thinning. What distinguishes this group is an apparent difference in the type of hafting modification. In the most extreme examples, side-notches result in a marked constriction at the junction of the working edge and basal portion of the scrapers and, consequently, a flaring of the lateral edges towards both the distal and proximal ends. The side-notching is variable in extent from scraper to scraper and even from side to side on the same scraper and shows a gradation to the straight-sided sub-group described above.

Table 20: Summary of metric attributes for concave-sided/side-notched rectangular endscrapers

	N	RANGE	MEDIAN	MEAN	STAND. DEV.
LENGTH	15	17.00 - 35.32	26.16	24.08	4.88
WIDTH	17	19.48 - 36.26	27.87	26.69	4.26
THICKNESS	17	4.12 - 7.48	5.80	5.92	0.97

All the scrapers in this group appear exhausted or nearly so, and this, combined with the constricted neck, gives many of these scrapers pronounced "graving spurs". All are made of Cow Head chert.

ii) **Triangular Endscrapers:** This is the second major form of endscraper from Phillip's Garden East. Here again, the term triangular is used loosely and there is considerable variation within the group. The 23 triangular scrapers are divided into two sub-groups.

Table 21: Summary of metric attributes for triangular endscrapers

	N	RANGE	MEDIAN	MEAN	STAND. DEV.
LENGTH	20	13.48 - 43.82	28.65	24.94	7.65
WIDTH	19	13.88 - 32.08	22.98	21.61	6.05
THICKNESS	23	2.76 - 8.62	5.69	5.03	1.67

a) Unnotched Triangular Endscrapers (Plate 15:A-J): Twenty-one scrapers are included in this sub-group. In general they are triangular in outline. Lateral edges are straight, slightly convex or slightly concave but always expand towards the distal end of the scraper. The working edge may be symmetric or asymmetric and is usually snub-nosed. Some dorsal surface retouch is common while ventral retouch occurs only in six cases. All but two have either unifacial or bifacial retouch on one or both lateral edges. The two scrapers lacking deliberate retouch do show signs of utilization along the lateral edges. This edge utilization or battering may be the result of wear from the haft. One scraper is unique in having extensive bifacial surface and lateral edge retouch resulting in a well formed triangular proximal segment. Overall size within this sub-group is extremely variable and may, at least partially, be due to varying degrees of resharpening. All are of Cow Head chert.

b) Side-notched Triangular Endscrapers (Plate 15:K,L): Two triangular endscrapers are unique in having a single side-notch on each lateral edge. One is extremely well made, with complete bifacial retouch on the lateral edges and symmetric notches. The second example is smaller and less well made but is of the same general form. As in the above sub-group, the working edges are steeply angled. Both are also of Cow Head chert.

iii) Flake Scrapers (Plate 14:J-M): The eight endscrapers included in this group are all made on thin flakes which show little modification beyond the preparation of the working edge. The working edge is generally snub-nosed and symmetric. Basal thinning is absent as is lateral edge retouch. However, all show signs of battering along the lateral edges, perhaps indicative of hafting. One of these these could be considered an end-of-blade scraper while the others are on irregular blade-like flakes which are rectangular, triangular or ovate in form. Once again, all are of Cow Head chert.

Table 22: Summary of metric attributes of flake scrapers

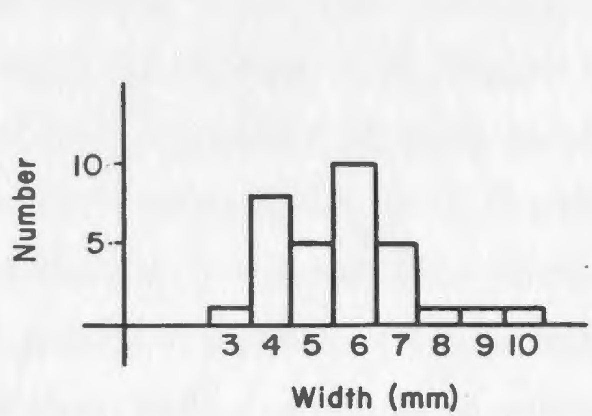
	N	RANGE	MEDIAN	MEAN	STAND. DEV.
LENGTH	8	24.72 - 29.42	-	-	-
WIDTH	8	18.54 - 29.54	-	-	-
THICKNESS	8	3.90 - 8.74	-	-	-

iv) Miscellaneous Endscrapers (Plate 15:M-P): An additional four endscrapers are unique. One has been fashioned out of the proximal section of a broken side-notched endblade (Plate 15:P). The scraper retains the distinctive endblade base but the blade has been shortened and the distal end re-worked to form a blunted convex scraping edge. A second scraper (Plate 15:M) is made on the distal end of a thick, irregular blade. It has careful retouch along the convex distal end and shows signs of utilization along the lateral edges. It has been burned and has numerous pot-lid fractures. The final two scrapers appear to be preforms. One thick blade-like flake has a large, bulbous, roughly convex distal end (Plate 15:N). A slight amount of irregular retouch is present along this end. A second flake (Plate 15:O) has careful bifacial retouch along both lateral edges creating a triangular proximal end. The distal end is a convex hinge fracture which lacks deliberate retouch but there is some evidence of utilization. All of these scrapers are of Cow Head chert.

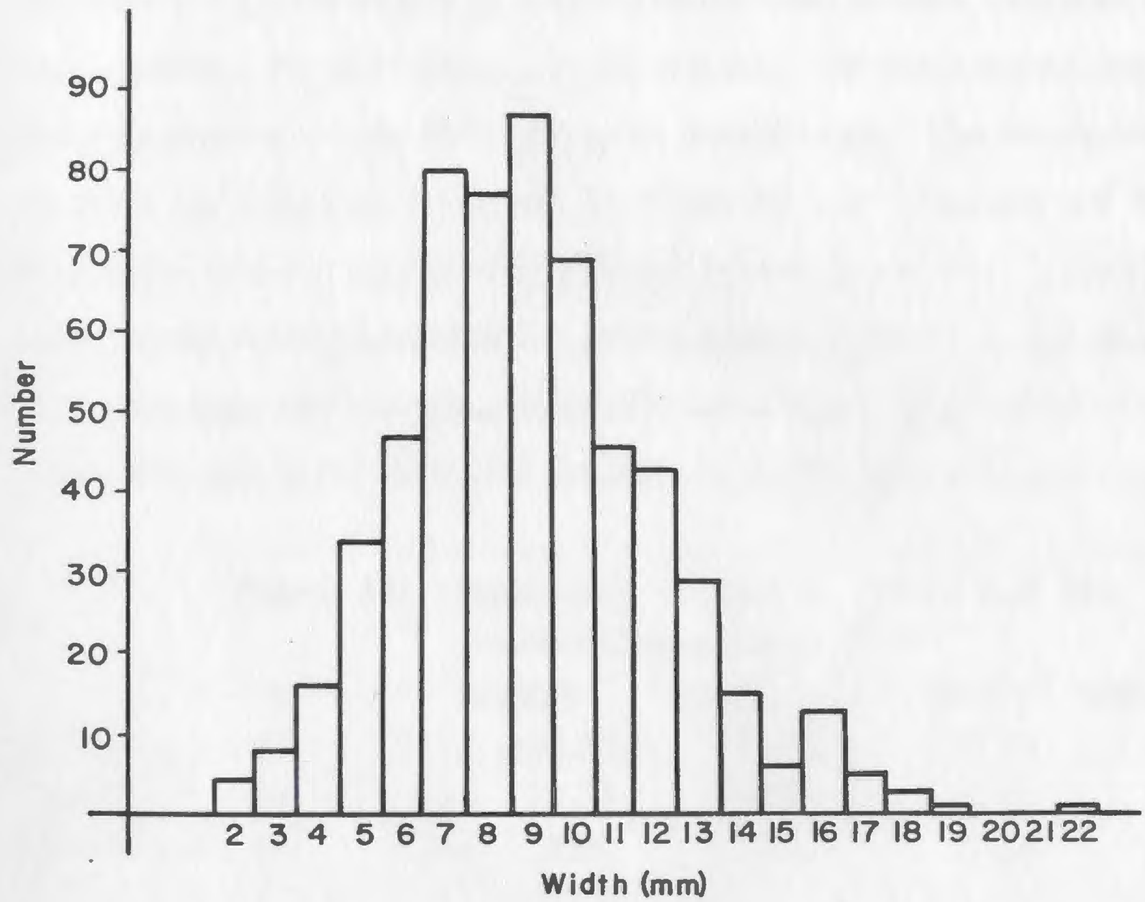
v) Scraper Fragments: Finally, 10 scrapers are too incomplete to permit placement in any of the above groups. Six are distal ends of varying sizes. Three of these have complete dorsal retouch and fairly low working edge angles. All have rounded corners and convex scraping edges. Four fragments are segments of the working edge only. All of the scraper fragments are of Cow Head chert.

5.3.3.7 Microblades/Blades (Plate 16)

In most Palaeo-Eskimo collections, a distinction is made between microblades and blades with the 11 mm width measurement as the dividing point (*cf.* Taylor 1962). However, the analysis of Factory Cove microblades/blades gave a unimodal width distribution with a peak at 10 mm (Auger n.d.:94). Width distributions for the microblades/blades from Phillip's Garden East gave a similar unimodal curve with a peak at 9 mm (Figure 21). As a result, microblades/blades will be considered as a single artefact class.



a) Quartz crystal



b) Chert

Figure 21: Microblade/blade width distribution

With 633 artefacts, this is by far the largest class in the collection. While microblades/blades have been included with the formed tools, only a small proportion show evidence of deliberate modification and most of the microblades/blades might more properly be considered expedient tools or even debitage. Of the total, 175 or 27.73 percent have some lateral edge retouch or utilization. Deliberate edge retouch is evident on only 31 of these or 4.91 percent of the total. Of those with edge retouch/utilization, it is bilateral in about half. Among those unilaterally retouched or utilized, there is a very slight preference for Edge A (the left lateral edge - see Appendix A). Twenty-five microblades/blades exhibit evidence of hafting modification, 17 with stems, 8 with notches. Of the notched examples, all but one have a single notch on each lateral edge. The exception has two notches on Edge A and one on Edge B. A summary of the metric attributes of the complete microblades/blades appears in Table 23. Thirty-three of the microblades/blades are of quartz crystal, 25 of Ramah chert, 3 of chalcedony and the remaining 570 are of Cow Head chert. It should be noted that this is the only artefact class in which quartz crystal is used.

Table 23: Summary of metric attributes for microblades/blades[6]

	N	RANGE	MEDIAN	MEAN	STAND. DEV.
LENGTH	40	9.06 - 69.80	39.43	29.70	13.37
WIDTH2[7]	40	2.84 - 17.32	10.08	8.85	3.49
THICKNESS	40	0.86 - 4.86	2.86	2.66	1.17

6 Only complete microblades/blades are considered in this tabulation.
7 See discussion of microblade/blade attributes in Appendix A.

5.3.3.8 Adzes (Plate 17:D-J)

A small and variable collection of adzes was recovered from Phillip's Garden East. In general, the seven complete adzes are rectangular to triangular in shape, usually expanding towards the bit end. The bits are bifacially bevelled but the bevelling is much steeper on the dorsal surface creating the typical adze blade shape. In all but one case, the bit edges have been carefully ground. The one exception has a roughly chipped working edge (Plate 17:D). It is difficult to determine whether this is the rough chipping in preparation for grinding or the result of heavy use. The fact that the rest of this adze show more careful finishing and that there is some dulling of the flake scar edges suggest that the latter interpretation is the most likely. One adze, the largest in the collection, is double-headed (Plate 17:H). Sizes are extremely variable with lengths of complete specimens ranging between 28.60 mm and 101.98 mm. The smaller examples are probably analogous to Fitzhugh's (1972:148) small triangular ground scrapers. This size range suggests different functions with the larger examples used for heavier wood-working and the smaller ones reserved for the finer scraping and finishing of wood or bone tools. However, there is a progression in size in the Phillip's Garden East adzes with no clear boundary between large and small. For this reason and the fact that we cannot be certain of varying function, the single term adze is used here. Three additional ground pieces appear to be adze fragments. The raw material used for these adzes includes a variety of green to brown slates, shales and siltstones with differing degrees of silicification.

5.3.3.9 Miscellaneous Ground Tools (Plate 17:A-C)

This group includes a number of carefully fashioned tools, the function of which remains uncertain. The most complete artefact in this category is part of a ground tabular object of green shale (Plate 17:A). One lateral edge has been carefully cut and snapped, while the opposite edge has a steep unifacial bevel. The two ends are roughly broken. Both surfaces and the bevelled edge have been ground smooth. The dorsal surface is covered with heavy, slightly irregular striations running parallel to the long axis of the piece. The ventral surface has numerous fine transverse striations overlain by deeper, more irregular longitudinal ones. The bevelled edge has very fine use-wear striations along its full length at a 45 degree angle from the ventral edge. This lower edge of the bevel is rounded also, apparently due to use-wear. Similar objects have been found in other Palaeo-Eskimo collections and a knife, scraper or chisel function is often ascribed (*cf.* Harp 1964:63-64; Renouf, personal communication, 1987). The use-wear along the bevelled edge of the example from Phillip's Garden East tends to support this idea but the deep striations on both surfaces are suggestive of an additional function, a fact also noted by Harp (1964:64). Use as a whetstone is one possibility.

A second piece appears to be an unfinished fragment of a similar object. It has two cut and snapped edges and one possibly bevelled edge. It is made of beige shale.

The final two objects in this group (Plate 17:B,C) are almost identical although they are both fragmentary. They are very thin (less than 3 mm) and roughly rectangular in outline with three finished and one broken edge. In both cases, the thickest edge is unifacially bevelled. The opposite edge and distal end are thinner and bifacially bevelled. Edges are ground with some evidence of chipping, while surfaces show varying degrees of grinding. One has a small v-shaped groove cut in the thin edge about 20 mm from the distal end. Overall dimensions are virtually identical with both having a maximum width between 21 mm and 22 mm and lengths between 28 mm and 34 mm. Both are made from shale, one green, the other beige. The function of these artefacts is unknown.

An additional 7 slate flakes have been ground on one surface and appear to be fragments of ground tools.

5.3.3.10 Stone Lamps and Cooking Vessel (Plate 18:A,B,D)

The collection of stone vessel fragments from Phillip's Garden East is very small, as is typical of all known Groswater sites (*cf.* Auger n.d.; Fitzhugh 1972; Loring and Cox 1986; Tuck n.d.). A total of five fragments was recovered, representing three very different vessels.

One fragment (Plate 18:A) is from the rim of what appears to have been a very shallow, round/oval vessel of approximately 80 mm in diameter. The vessel is made of micaceous siltstone (Botsford, personal communication, 1987) and has been well smoothed on both the internal and external surfaces giving it a slightly lustrous silver-grey appearance. The vessel is less than 5 mm thick and appears to have been no more than 10 mm deep. It may represent a small lamp.

Two more fragments come from the rim of what also appears to have been a very shallow round/oval lamp (Plate 18:B). Overall dimensions cannot be determined but it was obviously a larger and heavier vessel than the one described above. The material from which this vessel was made is extremely weathered and positive identification has not been possible beyond the suggestion that it is from an igneous formation, possibly gabbro (Botsford, personal communication, 1987).

Finally, two fragments join to form part of the base and corner of a rectangular cooking vessel (Plate 18:D). It is well made and highly reminiscent of the Middle Dorset soapstone vessels from Phillip's Garden and elsewhere (*cf.* Harp 1964:Pl. XXI; Renouf, personal communication, 1987). Burned fat is encrusted on parts of this vessel. This piece is clearly out of place in a Groswater context and it is not considered a valid part of the Groswater assemblage. Its presence in the site will be discussed in greater detail in Chapter 6.

5.3.3.11 Unidentifiable Stone Object (Plate 18:C)

Four fragments of loosely cemented sandstone form part of a roughly circular cobble approximately 100 mm in diameter. One surface of this cobble is complete. It is smooth, lightly pitted and is slightly depressed across the centre. The other fragments suggest additional smoothed surfaces. This object appears to have been subjected to heating and is partially encrusted with burned fat. The function of this piece remains uncertain. Ethnographic sources describe the use of essentially unaltered flat cobbles as lamps when properly made lamps were not available (Maxwell 1984:361). Maxwell (1985:193) also notes the use of basin-shaped lamps roughly made from cobbles at the late Pre-Dorset Lagoon site. It is possible that this cobble served such a function, especially given the apparent under-development of the soapstone industry in the Groswater phase. Some of the smoothed surfaces are more suggestive of a whetstone although striations are not visible on these surfaces. In addition, the whetstones recovered from other Groswater sites are of pink quartzite (Auger n.d.:104). The cobble might also have served as a hammerstone or possibly an anvil. Deposition in a hearth area might account for the presence of the burned fat and the fire-cracked appearance of this piece.

5.3.3.12 Cores (Plate 19:G-I)

A total of 82 chert cores was recovered from the site, however, most of these are small and fragmentary and 19 could more properly be called core rejuvenation flakes. The chert cores are predominantly flake cores with only five microblade/blade cores in the group. All the chert cores are of Cow Head chert.

A small number of quartz crystal microblade cores was also found at Phillip's Garden East. Only one of the six quartz crystal cores shows good microblade scars.

Due to the fragmentary nature of most of this material and the random nature of the flake scars on all but the microblade/blade cores, more detailed analysis of the cores was deemed unprofitable at present.

5.3.3.13 Blanks

In Groswater collections it is generally possible to distinguish between preforms and blanks. In the present analysis, preforms have been included with specific artefact classes. Twenty-one blanks were identified in the collection. These pieces showed crude flaking, minimal edge retouch and irregular shape and could not be placed in a single artefact class. All of the preforms are of Cow Head chert.

5.3.3.14 Flake Perforators (Plate 19:A-E)

Eight flakes appear to have been used as perforators. Two of these (Plate 19:A,D) are double pointed while the remaining six have a single point. In all cases there was some evidence of retouch and/or utilization of these points. The points range from slightly rounded to very sharp. All of the perforators are of Cow Head chert.

5.3.3.15 Burin and Burin-Like-Tool Spalls

One probable burin-like-tool spall was found in the watersift. The two outer surfaces of this spall are ground and have several facets forming a bevelled edge. There is some use flaking along this edge.

Although the collection from the site did not include any true spalled burins, one possible burin spall was also found in the watersift.

Both spalls are of Cow Head chert.

5.3.3.16 Tip-Flute Spalls

Five tip-flute spalls were recovered from the site. Two are primary spalls, two are secondary and one appears to be tertiary. All five are of Cow Head chert. None of these tip-flute spalls could be refitted with tip-fluted endblades from the site.

5.3.3.17 Ridge Flakes

Three ridge flakes, produced during the preparation of microblade/blade cores, were found at Phillip's Garden East. Two of these are from the same Cow Head chert core. The third ridge flake is of quartz crystal and shows some lateral edge utilization.

5.3.3.18 Pendant? (Plate 19:F)

One small triangular flake has an oval hole near the centre. While the hole itself appears to be natural, part of the margin has been carefully retouched. Additional retouch occurs along a pronounced flake scar ridge on the dorsal surface of the flake. In neither case can this retouch be of functional significance in terms of tool use. The only interpretation that comes to mind for this piece is that it served as a pendant.

5.3.3.19 Raw Material Use Patterns

A summary of the lithic raw material used for the main artefact classes is presented in Table 24. The chipped stone tools from Phillip's Garden East are overwhelmingly of Cow Head chert (see above, Section 5.3.2). Ramah chert, the local chalcedony and quartz crystal are used in limited amounts for certain artefact classes. Quartz crystal is used exclusively for microblades and, obviously, the cores from which these were struck The local chalcedony is a relatively poor material and its use for tools is confined to a few bifaces, microblades and retouched or utilized flakes. While it is thought to occur in the immediate Port au Choix area, the poor flaking qualities of the chalcedony, especially when compared to Cow Head chert, probably account for is minimal representation in the assemblage. Ramah chert is used primarily for microblades/blades. The exotic nature of this material and the great distance to its source would explain the limited use of Ramah chert at Phillip's Garden East.

Other lithic artefacts are made from a variety of materials. Various forms of silicified slate, shale and siltstone are used for the adzes and other ground "slate" artefacts. Soapstone, siltstone and an unidentified igneous rock, possibly gabbro, are used for the stone vessels. Sandstone, used for an unidentified object, completes the list of lithic raw materials used in the Phillip's Garden East assemblage.

Table 24: Raw material use patterns for chipped stone tools

	COW HEAD		RAMAH		CHALCEDONY		QUARTZ	
ARTEFACT CLASS	n	%	n	%	n	%	n	%
mircoblade/blade	572	90.36	25	3.95	3	0.47	33	5.21
ret./ut. flake	158	99.37	-	-	1	0.63	-	-
endblade	147	98.66	2	1.34	-	-	-	-
unid. biface	116	95.87	3	2.48	2	1.65	-	-
endscraper	90	98.90	1	1.10	-	-	-	-
core	74	90.24	-	-	2	2.44	6	7.32
burin-like-tool	46	100.00	-	-	-	-	-	-
knife	34	100.00	-	-	-	-	-	-
blank	20	100.00	-	-	-	-	-	-
sideblade	14	100.00	-	-	-	-	-	-
perforator	8	100.00	-	-	-	-	-	-
tip-flute spall	5	100.00	-	-	-	-	-	-
ridge flake	2	66.67	-	-	-	-	1	33.33
burin/b-l-t spall	2	100.00	-	-	-	-	-	-
total	**1288**	**94.22**	**31**	**2.27**	**8**	**0.59**	**40**	**2.93**

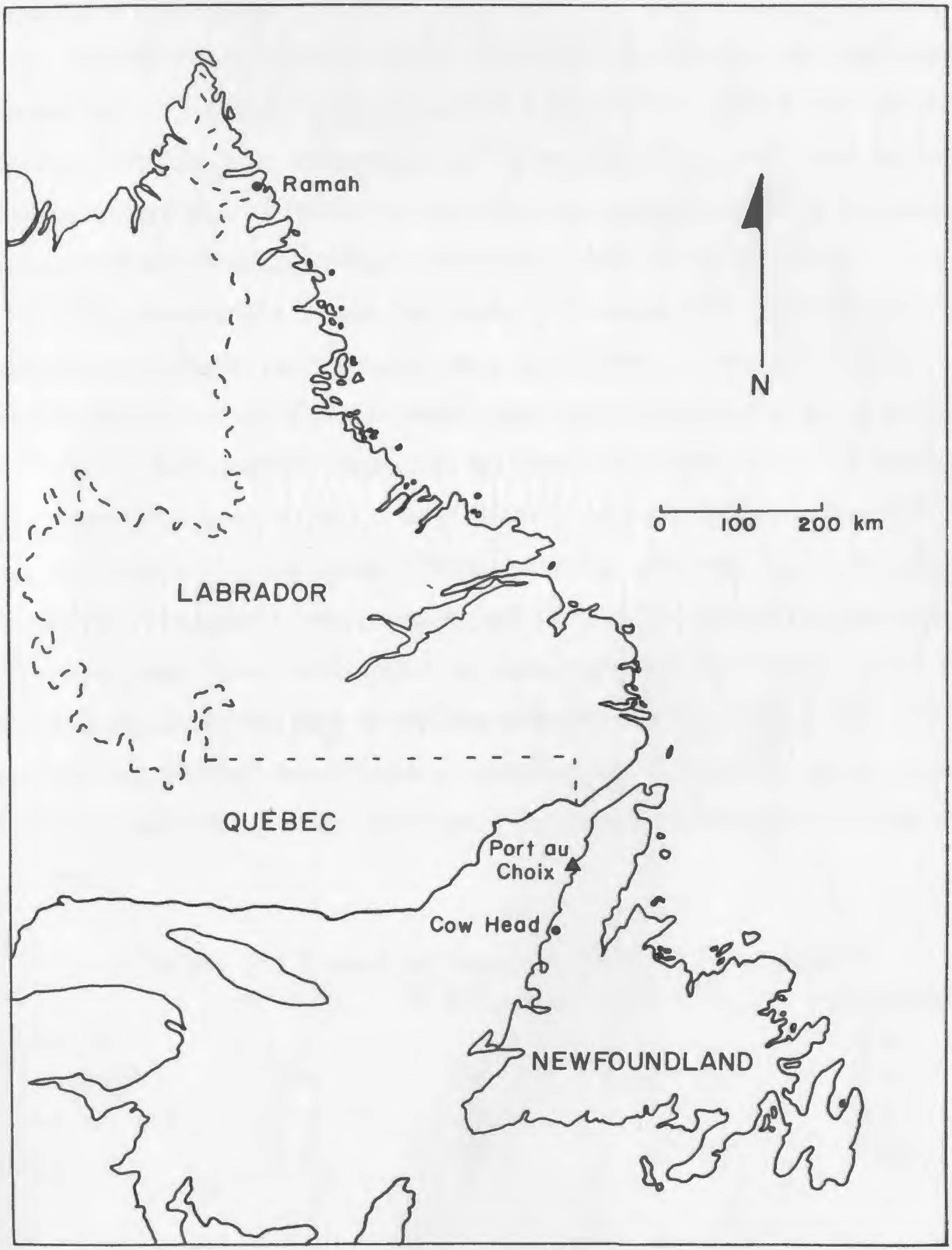


Figure 22: Principal lithic raw material source areas

5.3.3.20 Debitage

While a detailed analysis of the debitage from the site was considered beyond the scope of the present study, a rough division of this material was made in the hopes of obtaining some indication of the extent of primary reduction and tool manufacture at the site as opposed to tool resharpening and reworking. Results of this division are presented in Table 25.

The use of the terms "primary", "secondary" and "retouch" is arbitrary and in the present study they are defined as follows. "Primary" flakes include decortification flakes and those over 4 cm in maximum diameter. "Secondary" flakes were between 4 cm and 1.5 cm. They were considered too small to be primary flakes or to have served as tool blanks but too large to be the result of final retouch. Finally, "retouch" flakes were those less than 1.5 cm in maximum size. It should be noted that many of the retouch flakes were extremely small (less than 5 mm). As these smallest flakes would have passed through the 1/4 inch screen used in the general excavation, their recovery was largely confined to areas where back-dirt was water-sifted. Thus, they are clearly under-represented in the sample.

Table 25: Lithic debitage distribution by size

	NUMBER	FREQUENCY	WEIGHT (g)	FREQUENCY
Primary	48	0.31	478.40	8.81
Secondary	2544	16.17	3030.65	55.84
Retouch	13142	83.53	1918.19	35.34
Total	15734	100.01	5427.24	99.99

Even given this bias, retouch flakes account for 83.53 percent of the debitage. It is extremely difficult to compare numbers of retouch flakes with numbers of primary or secondary flakes for the obvious reason that the production of one tool may produce many retouch flakes, fewer secondary flakes and still fewer primary flakes. Nevertheless, the results presented here suggest some tool resharpening and/or finishing occurred at Phillip's Garden East and comparatively little primary reduction and manufacture. This interpretation is supported by the weight distribution of the debitage. It is also supported by the high proportion of finished tools in the collection and the relatively small number of cores, preforms and blanks.

The distribution of the debitage in terms of raw material (Table 26) also seems to correlate with the artefact collection (see Table 24). Cow Head chert represents 97.89 percent of the debitage, while Ramah chert, quartz crystal, chalcedony and slate are all less than one percent each. Over 90 percent of the Ramah chert debitage is tiny retouch flakes, a further indication of its exotic nature.

Table 26: Lithic debitage distribution by raw material type

	NUMBER	FREQUENCY	WEIGHT (g)	FREQUENCY
Cow Head chert	14889	94.63	5240.99	96.57
Ramah chert	74	0.47	11.95	0.22
Quartz crystal	58	0.37	7.70	0.14
Chalcedony	713	4.53	166.60	3.07
Total	5734	100.00	5427.24	100.00

5.3.3.21 Miscellaneous Raw Material

A variety of raw material that did not show signs of deliberate human alteration was also recovered from Phillip's Garden East. This material included 70 quartz crystals, 237 chert chunks and 22 pieces of slate or shale. The quartz crystals include a number of complete crystals which may have been collected for their aesthetic value but the majority are fragmentary or irregular. Some originated in the limestone beach rocks found in the site. Eight of the chert chunks are of chalcedony, the rest are of Cow Head chert. The majority are small (less than 1.5 cm in diameter) pieces of shatter.

5.4 Organic Artefacts

5.4.1 Methodology

The organic artefact collection from Phillip's Garden East is small and clearly unrepresentative but still highly significant as it gives us our first glimpse of the organic component of the Groswater Palaeo-Eskimo phase. Due to the small size of the collection, its variability, and the absence of directly comparable material, identifiable artefacts will be individually described. Among the worked bone pieces, only two functional tool classes have been identified: harpoon heads and flaking punches.

5.4.2 Artefact Description

5.4.2.1 Harpoon Heads (Plates 20, 21)

Surprisingly, given the small size of the organic component, five recognizable harpoon heads and an additional, more problematic, one were recovered during the excavation. Unfortunately, none of these is complete;

however, individually and as a group they provide a great deal of information. It is especially interesting that no two of these is alike.

The first harpoon head (Plate 20:F, 21:F) has been alluded to above. It is the distal section of a harpoon head suited for hafting with the typical Groswater side-notched endblade. It is markedly plano-convex in cross-section. The ventral surface has been carefully cut to produce a flat platform or bed for the ventral surface of the endblade. Approximately 22 mm from the tip of the harpoon head, the platform ends in a ledge 2.5 mm high. The straight, dorsally bevelled base of the endblade would have fitted against this ledge. Opposite this platform, a hole has been gouged transversely through the dorsal surface of the harpoon head creating a type of spur. The centre of this spur is about 11 mm from the distal tip. Lashing through this spur and around the side-notches would have secured the endblade to the harpoon head. Shallow grooves are present on both lateral edges adjacent to the spur. It is impossible to determine whether these grooves were intentionally formed or whether they are the result of wear from the lashing. There is a single gouged line hole with the long axis of the harpoon head on the dorsal surface but cut transversely on the ventral surface. The harpoon head is broken at the distal end of the socket, but the socket appears to have been open.

A second harpoon head, which was found immediately below, is virtually complete, missing only a portion of the left lateral edge and basal corner (Plate 20:C, 21:C). Unlike the first harpoon head described above, this one is self pointed. The transverse cross-section of the blade is diamond shaped but almost plano-convex. Once again, there is a single gouged line hole, cut in the same way as the one described above. The base is slightly concave, resulting in two short, symmetric basal spurs. The harpoon head has an open socket which is triangular in outline with a slightly rounded distal end. The socket floor is flat, with straight lateral edges.

Another harpoon head is partially reconstructable from five recovered fragments (Plate 20:D, 21:D). It appears to have been self-pointed although the extreme blade tip is missing. The overall cross-section is roughly oval. A single oval line hole, gouged parallel to the long axis of the harpoon head, is suggested although the harpoon head is badly damaged in this area. The base has two symmetric spurs with deep grooves approximately 5 mm wide cut into both lateral edges just above the bifurcation. The socket area is badly damaged; however, two finished edges on the ventral surface indicate an open or slightly flanged socket.

The fourth harpoon head is also in several pieces with the main breakage occurring at the line hole (Plate 20:E, 21:E). The base is bifurcate with a longer spur on the left side. The harpoon head has an essentially open socket with very slightly flanged lateral edges. The socket shape is triangular with straight lateral edges but the socket floor is slightly concave. The oval line hole is partially damaged but appears to have been cut transversely on the ventral surface and longitudinally on the dorsal surface. The harpoon head is probably self pointed although the blade tip is broken. It is unique in having a single barb on the right lateral edge.

The fifth harpoon head is represented by a base section broken along the right lateral edge, and cut above the line hole (Plate 20:A, 21:A). The base is concave but the concavity is shallow resulting in very short basal spurs. The open socket is slightly flanged. Socket shape is triangular with a flat floor. The line hole is roughly oval and is, once again, cut longitudinally on the dorsal surface and transversely on the ventral surface.

The possible harpoon head is a small piece broken at both ends (Plate 20:B, 21:B). At one end is the beginning of a platform similar to that found on the first harpoon head described above except that it is much smaller. This end appears to have snapped at a groove 3.75 mm above the beginning of the ledge. This would be an appropriate distance for lashing around the side-notches of an endblade. A gouged line hole, similar to the line holes on the harpoon heads described above occurs near the other, broken end. Running between the platform and this hole on the ventral surface are two parallel grooves, which appear similar to the "blood grooves" found on Pre-Dorset harpoon heads (*cf.* Maxwell 1985:86). Given the absence of the distal tip and of the socket area, designation of this piece as a harpoon head remains problematic. It is too small for all but the very smallest endblades from the site. Given its small size, another interpretation is that this piece served as an arrow head.

5.4.2.2 Flaking Punches (Plate 22:A-D)

Two definite flaking punches were recovered from the site (Plate 22:A,B). These two artefacts are virtually identical. Transverse cross-sections are sub-rectangular to oval near the tip. Lateral edges are straight and expand slightly towards the distal end. The proximal ends are scarfed, while the distal ends are rounded and slightly bulbous in both examples. Overall lengths for these two flakers are 45 mm and 55 mm.

Three other organic artefacts probably belong to this class and will be described here. The first of these is made of walrus ivory (Plate 22:C) (Cumbaa, personal communication, 1986). The piece has been roughly worked to a sub-rectangular shape and one end has been smoothed to a broad rounded point. The other two possible flakers are of bone. They have the same sub-rectangular form and rounded bulbous distal end typical of the other flakers.

5.4.2.3 Unidentifiable Organic Artefacts (Plate 22:E-J)

A number of bone artefacts are recognizable tool fragments but their function cannot be determined. Two objects are similar in having a convex, slightly asymmetric end (Plate 22:I,J). The dorsal surfaces are rounded, especially in the case of the larger of the two objects. In both cases, the ventral surface has been scarfed towards the rounded end. At the opposite end, a long slit has been gouged through the centre of the object. On the larger example, this end is broken, however, on the smaller one, the end appears to have been bifacially cut and snapped.

Four pointed objects are also included in this group (Plate 22:E-H). One of these, a long thin circular piece of bone, is badly weathered but one end appears to have been worked to a sharp point. A second "point" has a roughly cut triangular end. The object has been cut longitudinally resulting in a flat ventral surface at the pointed end. Below this, the transverse cross-section is bi-convex. The proximal end is broken. Two objects are small pointed fragments. Possibly, these objects functioned as awls or punches; however, their fragmentary nature and the absence of visible striations make positive assignation impossible. The final artefact in this group may be part of a barbed point. The piece is split longitudinally with the result that only a portion of one surface remains. The proximal end has been cut straight and smoothed. Just up from the base, along what is now a broken edge, the distal end of a deep groove is visible.

An additional ten pieces show evidence of extensive shaping but are too fragmentary to permit identification or warrant description.

5.5 Summary

To conclude this chapter, the artefact assemblage from Phillip's Garden East will be briefly summarized. In the next chapter, specific aspects of the artefact assemblage will be re-examined as they pertain to site function and seasonality and intra-site chronology. Chapter 7 will compare the assemblage from Phillip's Garden East with the standard description of Groswater material culture.

The artefact assemblage from Phillip's Garden East is one of the largest recovered from a Groswater site to date and is the first to contain organic artefacts. At the same time, it is apparent that the assemblage does not represent the complete spectrum of tools utilized by the Groswater people. Most of the formal lithic tool classes recognized in Palaeo-Eskimo assemblages are found at Phillip's Garden East. These include endblades, knives, sideblades, burin-like-tools, scrapers and adzes.

The debitage, cores, blanks and preforms all indicate some amount of tool manufacture and/or maintenance at Phillip's Garden East. Tool manufacture is also indicated by the presence of flaking punches. The generally small size of the debitage as well as the small number of preforms and cores suggests that most primary lithic reduction occurred elsewhere and that the flint-working at the site was largely tool finishing, resharpening and reworking. This suggestion is supported by the absence of hammerstones at the site. The apparent absence of whetstones is more difficult to explain. The grinding present on burin-like-tools, adzes and some of the endblades, knives and scrapers indicates the need for whetstones. Presumably, this grinding would have occurred during the final stages of tool manufacture. Whetstones are reportedly rare in Early

Palaeo-Eskimo sites and this general scarcity may account for their absence from Phillip's Garden East.

In general terms, hafting modification is typical of many Groswater lithic tools. A large number of the lithic artefacts from Phillip's Garden East suggest hafting of some form or another. Side and, more rarely, corner notches seem to be the preferred hafting technique. Notches occur on endblades, knives, burin-like-tools, scrapers and microblades/blades. In addition, stems are present on some scrapers and microblades/blades. It is these hafting attributes that are the distinctive elements on many Groswater artefacts.

The raw material used for the lithic component at Phillip's Garden East is predominantly Cow Head chert. Smaller amounts of Ramah chert, quartz crystal and a local chalcedony are also used for the chipped stone tools. Other lithic artefacts are manufactured from a variety of silicified slates, shales and siltstones as well as soapstone and gabbro.

The small organic component is clearly unrepresentative of the full range of organic artefacts undoubtedly used by the Groswater people. Lances, bows and arrow, leisters, bird barbs, awls, punches and hafts for scrapers, burin-like-tools, knives, adzes and microblades/blades are all likely additions to the harpoon heads and flaking punches found in the collection. Their absence from this small sample of organic artefacts cannot be used to suggest that they were not used at the site.

Chapter 6
Site Interpretation

6.1 Introduction

This chapter will examine the site from two main perspectives. The first will be a general discussion of site function and seasonality. It will draw primarily on the substantial faunal collection from the site and, secondarily, on artefactual data. The second part of the chapter will examine the site in more specific terms trying to isolate differences between the various levels and areas of the excavation. This will involve a synthesis of the artefactual, stratigraphic, feature and dating information presented in the two preceding chapters and will examine some of the questions raised in these chapters. Given that only a small proportion of Phillip's Garden East has been excavated to date, interpretations of the site must remain limited and somewhat speculative at this time.

6.2 Site Function and Seasonality

6.2.1 The Faunal Assemblage from Phillip's Garden East

To date, approximately 30,000 faunal elements from Phillip's Garden East have been identified by Darlene Balkwill of the Zooarchaeological Identification Centre, National Museum of Natural Sciences, Ottawa. This represents approximately 75 percent of the total faunal assemblage from the site and includes material from all levels and areas of the excavation and all water-sifted samples. This faunal material will be discussed as a single unit. No horizontal or vertical differences in the faunal assemblage were readily apparent (Balkwill, personal communication, 1987), except for the fact that faunal material was most plentiful in Level 3A. In addition, review of the site stratigraphy and artefact provenience both suggest mixing of levels which would further limit the usefulness of a level by level consideration of the faunal material.

A list of species represented in the Phillip's Garden East assemblage is presented in Table 27. Additional species identified in material that was not sent to the Zooarchaeological Centre include walrus (1 element) and whale (2 elements). The walrus ivory was modified into a flaking punch (see Chapter 5.4.2.2) while the whale bone appeared unmodified.

Clearly seals, and more specifically harp seals, were the primary resource exploited by the Groswater inhabitants of the site. Given the site location as outlined in Chapter 3, this was to be expected. The presence of bearded, harbour, ringed, hooded and possibly grey seals in addition to the harp seal, indicates that the full range of available seal species was exploited. The single example of walrus ivory and the few fragments of whale bone may represent scavenged material, or in the case of the ivory, a curated or traded object. There is no evidence that Early Palaeo-Eskimo groups were actively hunting whales (Maxwell 1985). While walrus were hunted, the absence of walrus bones in the rest of the faunal collection suggests that walrus hunting was not taking place at Phillip's Garden East.

Table 27: List of species in Phillip's Garden East faunal assemblage

SPECIES	NUMBER OF ELEMENTS
Mammals	
beaver	6
red fox	2
arctic/red fox	3
marten	10
caribou	7
bearded seal	7
harbour seal	2
ringed seal	2
harp seal	201
hooded seal	10
grey/harp seal	1
grey/hooded seal	9
harp/harbour seal	1
ringed/harbour seal	4
seal	7218
unidentified mammal	20451
Birds	
Canada goose	1
snow/Canada goose	1
common/king eider	22
oldsquaw	2
white-winged scoter	1
eider/white-winged scoter	1
duck	19
bald eagle	6
willow ptarmigan	2
willow/rock ptarmigan	1
great black-backed gull	80
large gull	354
dovekie	1
common/thick-billed murre	9
murre/razorbill	1
black guillemot	5
blue jay	1
common raven	1
unidentified bird	1295
Fish	
Atlantic herring	2
Atlantic cod	3
American plaice	2
unidentified fish	2
Class uncertain	170
Total	29915

Both the diversity and total number of land mammals represented is relatively small. These animals were likely obtained on an encounter basis and were not the primary focus of subsistence at the site. While seven elements of caribou were identified, all these pieces were fragments of antler. It is likely that the antler was curated from kills at other sites for tool manufacture. Some of the antler may also have been scavenged as one piece comes from a shed antler. Since caribou do not appear to have frequented coastal areas along the west coast of the Great Northern Peninsula (Cameron 1958:104), Phillip's Garden East would not have been well situated for direct caribou exploitation.

Small mammals are represented by beaver, marten, red fox and possibly arctic fox. While arctic fox are a rare visitor to insular Newfoundland, they have been reported on the Northern Peninsula (Cameron 1958), usually arriving on the spring ice. Beaver, marten and red fox would have been readily available in the immediate site area. The majority of the unidentified mammal elements are probably seal (Balkwill, personal communication, 1987); however, the presence of a greater number or variety of land mammals cannot be ruled out.

Birds probably represent the resource of secondary importance to the inhabitants of the site. A large number of species were identified in the collection. All of these species would have been available in the immediate Port au Choix area with its coastal, heath, shrub forest and pond environments (see Chapter 3). Once again, the variety of species and the small number of elements for any one species suggests hunting on an encounter basis rather than the systematic culling of a particular species. The one exception appears to be large gull species for which there are 434 identifiable elements, a number substantially larger than that for any other bird species. The fact that the bald eagle is represented by foot elements only may indicate ritual as well as culinary importance for some of these species.

The very small number of fish bones in the collection can be interpreted in several ways. If fishing occurred at Phillip's Garden East, it may be that the relatively small and fragile fish bones suffered more from taphonomic processes than the larger and more dense bird and mammal bones and thus are under-represented in the archaeological collection. The limited use of water-sifting may have further increased this bias. It is also possible that no fishing occurred at the site and that the few fish elements were introduced by way of seal stomachs or other "natural" means.

6.2.1.1 Seasonality Indicators from the Faunal Assemblage

The faunal assemblage from Phillip's Garden East does provide some clues as to the season of site occupation. Seal and bird species are particularly useful in this regard. The harbour seal is the only seal to remain in the study area year round; however, they usually stay far off-shore during the winter. Harbour seals would have been easiest to exploit during the spring whelping season through until the fall when they often haul out along the coast (Boulva and McLaren 1979). Both the harp and hooded seals are migratory and pass through the Strait of Belle Isle twice a year. For both species, the northward migration begins just after the breeding season in late April. At this time, the harp seals pass very close to the west coast of Newfoundland while the hooded seals remain farther off-shore. The fall migration brings both species through the Strait and into the Gulf of St. Lawrence during December and January but the migration route is traditionally along the Labrador shore and not close to Port au

Choix (Mansfield 1967; Sergeant 1985; Northcott and Phillips 1976; Templeman 1966). Bearded and ringed seals are found in more northerly areas but occasionally drift south on the ice during the spring and early summer and may appear in the study area at these times. Grey seals usually remain further to the south in the Maritimes and so do not breed in the area, however, they may be found in the Port au Choix area during the spring and summer (Mansfield 1967). Their presence in the Phillip's Garden East faunal assemblage is uncertain. Thus, the range of seal species present in the assemblage points towards a spring occupation but does not rule out occupation at other times of the year.

The relative age categories for the seal elements provide more specific seasonality information. Seals of all relative ages are represented in the collection (Table 28). Juvenile/fetal elements indicate at least two individuals aged less than one week. Unfortunately, we do not know which species of seal these elements belong to although harp or harbour seal is most likely. The whelping season for harp seals usually occurs from late February to early March, although the exact time may vary with the onset of spring (Templeman 1966). Thus, if conditions were colder at the time of the Groswater occupation (see Chapter 3), whelping may have occurred slightly later. Hooded seals whelp in late March (Mansfield 1967) while harbour seals whelp in late May (Boulva and McLaren 1979). Bearded, ringed and grey seals also whelp in this general period from late February to May (Mansfield 1967). On this basis, we can be relatively certain of an occupation in the February to May time period. Once again, occupation at other times of the year is not ruled out by this evidence.

Table 28: Relative age categories for seal elements

SPECIES	juv-fet	juv	imm-juv	imm	y.adult	adult
bearded	-	-	-	4	-	-
grey/harp	-	-	-	-	-	1
grey/hooded	-	-	-	-	-	1
harbour	-	-	-	1	-	1
harbour/harp	-	-	-	-	-	1
ringed/harbour	-	-	-	3	-	-
harp	-	-	2	6	4	6
seal	7	133	49	1072	176	1036
total	7	133	51	1086	180	1046

Basis for relative age[8] category determinations:

fetal (fet): epiphyses unfused, porous cortex, size.
juvenile (juv): epiphyses unfused, undeveloped morphological features, porous "juvenile" cortex.
immature (imm): epiphyses unfused, "juvenile" cortex absent or present only around margins of epiphyses.
young adult (y.adult): epiphyses partially fused with fusion line visible.
adult: epiphyses fully fused, fusion line not visible.

The bird species provide additional seasonal indicators. A number of the species represented in the assemblage are available in the study area on a year round basis. These include the bald eagle, willow ptarmigan, great black-backed gull and other large gull species, black guillemot, blue jay and common raven. The rock ptarmigan is also available year round but is generally found higher up in the Long Range Mountains and would not have been immediately accessible from Port au Choix. The eiders, murres, oldsquaw, white-winged scoter, dovekie and razorbill winter off-

8 Our present knowledge of seal development does not permit the determination of chronological age for seal elements.

shore along the coast and are generally present in the study area from mid-October to late April. The common eider and white-winged scoter may breed in the area and occasionally remain through the summer. Canada geese are a common spring and fall migrant, often breed and summer on the ponds and barrens in the area and occasionally over-winter. The snow goose is a rare migrant through the area. This generally supports the seal data indicating a late winter to spring occupation. However, there is no evidence for a special exploitation of migratory bird species. This seems somewhat anomalous with a spring occupation. Studies of the area suggest that Port au Choix is an important stop-over area for migratory species but that it is less suitable as a staging ground (see Chapter 3). This anomaly may be explained by the greater importance of the seal hunt at this time of year. Following this line of argument, the large number of gull elements may suggest occupation at a time when other significant resources, such as seals, were not readily available.

The fish provide little information on seasonality, especially given their uncertain status in the assemblage. All three species identified congregate in the shallow waters off the west coast of Newfoundland during their spawning periods. Atlantic cod spawn in May. Atlantic herring usually spawn in May but spawning may occur anytime from May until November. Finally, American plaice spawn in July or later (Leim and Scott 1966). During the winter these fish remain off-shore in deep water. Thus, these species would probably have been easiest to exploit during the spawning periods. However, winter fishing cannot be ruled out particularly in the absence of any knowledge of Groswater fishing technology.

6.2.1.2 Functional Indicators from the Faunal Assemblage

As indicated above, the faunal assemblage suggests a primary focus on the exploitation of the spring seal migration with a secondary exploitation of birds. A preliminary examination of the seal elements seems to indicate an over-representation of cranial and flipper elements. This could be explained by the tendency of cranial elements to fragment, the density and ease of identification of auditory bulae and phalanges and, obviously, the greater proportional representation of phalanges in the skeleton. If however this over-representation is born out by a more detailed examination of the material, it would indicate primary butchering at the site and, more tenuously, that the high quality cuts of meat were transported, consumed and discarded elsewhere.

Another major anomaly appears in the element ratios for great black-backed gull and *larus sp.* In both cases, the number of humeri is far greater than the number of femora. For *larus sp.* the ratio is 7:1 while for great black-backed gull the ratio is 4:1. As both these bones are of similar size, density and identifiability, this discrepancy must be due to differential treatment in butchering or discard patterns. As more meat is associated with the femur, this may be another indication of processing at the site for the transport or storage of high quality cuts of meat. For other bird species, the number of elements is too small to permit the detection of similar patterns.

6.2.2 Additional Indicators of Site Function and Seasonality

The artefact assemblage from Phillip's Garden East also provides some clues as to the site's function. The high number of endblades in conjunction with the harpoon heads indicates an emphasis on sea mammal hunting, almost certainly seal. If we accept Fitzhugh's (1972) suggestion that medium sized side-notched endblades are for sealing harpoons, the size of the endblades from Phillip's Garden East may also be used to support the interpretation of a primary focus on seal hunting (see Chapter 5.3.3.1). The scrapers, microblades/blades, knives and utilized and/or retouched flakes may all be related to butchering and hide preparation suggesting that some processing of the meat and skins was undertaken at the site. Debitage, cores, blanks, preforms and flaking punches indicate tool manufacture and/or maintenance at Phillip's Garden East. The generally small size of the debitage as well as the small number of cores, blanks and preforms suggests that most primary lithic reduction occurred elsewhere and that flint working at the site was largely tool finishing, resharpening and re-working. The absence of hammerstones supports the argument for little primary reduction at the site. Given the lack of any good lithic quarry in the immediate site area and the associated assumption that the Groswater inhabitants of Phillip's Garden East were obtaining the vast majority of their raw material from Cow Head approximately 100 km to the south, it is logical that most primary lithic reduction would have occurred elsewhere.

Unfortunately, the house feature does not provide a clear indication of site seasonality. The absence of internal storage features and hearth areas may indicate a warm season occupation. The absence of hearth areas could, however, be explained by the use of oil lamps. Two small lamps were recovered from the site (see Chapter 5.3.3.10) and both appear to be associated with the house feature (see Appendix C, Figure 33). The semi-subterranean nature of the house suggests construction at a time when the ground was not frozen; however fires could have been used to thaw the ground.

6.2.3 Summary of Site Function and Seasonality

The faunal data suggests that the main occupation of Phillip's Garden East occurred from late winter through the spring and was primarily focused on the exploitation of the harp seal migration. Occupation of the site for a longer period or at other seasons of the year cannot be ruled out on the basis of the faunal data. However, if occupation of the site occurred at other time periods, especially during the fall and early winter, one would expect a greater diversity of land mammals and, in particular, the presence of caribou. The seal and bird element data indicate processing for storage, probably at another location. Further excavation at Phillip's Garden East is required in order to accurately determine whether there are any storage facilities or other features at the site which would suggest occupation through other seasons.

The large artefact assemblage recovered from a relatively small area suggests intensive or repeated occupation. The impression is of a temporary base camp at which exploitation, processing and general maintenance activities occurred. However, as Binford (1980) notes, special purpose camps are usually situated in the optimal location for the exploitation of a specific resource and are therefore often used repeatedly with the result that they may take on the appearance of a more substantial site. As the Port au Choix/Point Riche Peninsula is one of only a few prime locales for exploitation of the spring harp seal migration, this factor may account for the relatively large artefact accumulation at Phillip's Garden East.

The negative evidence from the site argues for the use of different site locations at other times of the year and for other activities. There is no evidence for quarrying or extensive primary lithic manufacture at the site. The procurement of lithic raw material would have necessitated trips to or trade with the Cow Head area for Cow Head chert and, to a much lesser extent, with northern Labrador for Ramah chert. The chalcedony and quartz crystal were locally available but of much less significance in the lithic assemblage (see Chapter 5.3.3.19). Specific sources for the other raw materials used at Phillip's Garden East remain unknown but may have been at some distance from the site. The absence of caribou bones, the minimal representation of small land mammals and the insignificant number of fish elements suggests that exploitation of these species may have occurred at other locations.

In general terms, Phillip's Garden East can be interpreted as part of a seasonal round which sees the use of base camps and special purpose exploitation camps at different locations as resources become seasonally and geographically available. Following Binford (1980) the Groswater inhabitants of Phillip's Garden East were probably collectors with a logistically organized settlement and subsistence system as a means of adapting to the temporal and spatial incongruity in the availability of critical resources. Once again, it must be emphasized that this remains an hypothesis in need of further testing. This testing would necessitate further excavation at Phillip's Garden East and a more comprehensive regional survey aimed at locating sites of differing function and seasonality.

6.3 Intra-Site Comparisons

The preceding analysis of both the artefactual and faunal data has considered the site as a single unit. This approach was taken because of the apparent mixing of stratigraphic levels which made any positive association between artefacts or faunal material and stratigraphy impossible. However, limited intra-site comparisons are possible. Combining all sources of information (artefactual, feature, dating and stratigraphy) permits some meaningful speculation on the internal chronology of the site.

The discovery of two cultural layers during the 1986 excavation raised the hope of being able to relate specific artefact styles to specific stratigraphic levels and, possibly to radiocarbon dates. This would have provided valuable and much needed information on stylistic change during the Groswater phase. As analysis proceeded, many obstacles to such an undertaking emerged. As has been discussed in Chapter 4, analysis indicated a more complex stratigraphy with mixing of the levels and a confusing association between levels and radiocarbon dates. Tool re-fitting highlighted the problem of mixed levels with mends occurring between artefacts from combinations of all the various levels (see Appendix C, Figures 26 to 34). Given the fact that the site may represent an occupational sequence of up to one thousand years compressed into a few centimetres of cultural deposits, it is not surprising that such mixing has occurred. There is a growing recognition among archaeologists of the need to study site formation processes and post-depositional events, both natural and cultural, which may have a significant effect on the type and location of material recovered (*cf.* Butzer 1982; Schiffer 1987). In the case of Phillip's Garden East, it is clear that the construction of the house feature played a major role in disturbing the stratigraphy at the site.

Freeze/thaw action may also be responsible for differential sorting of material. Undoubtedly there are other factors which contributed to the site formation. Nevertheless, examining the artefacts as they occur in the stratigraphic levels provides some valuable information.

Levels 1 and 4 did not contain cultural material. Level 1 was the upper covering of sod and peat which formed after the site occupation. Level 4 was the sterile sub-soil of sand, gravel and limestone beach cobble. Levels 2, 3, 3Upper, 3A, and 3Lower all contained cultural material and need to be examined in greater detail.

Level 3Lower is probably a leach zone between the rich cultural deposit of Level 3A and the sterile sub-soil of Level 4. The soil of this level lacked the dark charcoal staining found in the two cultural levels. The few artefacts and small amount of faunal material attributed to this level probably derived from the upper Level 3A.

Level 3A appears to represent the main Groswater occupation at the site. Artefacts recovered from this level, and from Level 3Lower, appear relatively homogeneous and generally fit comfortably within the present definition of Groswater material culture (Table 29 - see also Appendix B, Tables 33 to 38). The dark soil staining, abundant artefacts, faunal material and fire-cracked rock all point towards repeated or extensive occupation. A manipulation of the radiocarbon dates (see Chapter 4.5) would date this occupation to a four hundred year period from *ca*. 2700 B.P. to *ca*. 2300 B.P. Once again, this fits comfortably within our present definition of the Groswater phase time span. Five features were located in this level. Three of these were flake concentrations (Features #8, #9A and #11) while two were major bone concentrations (Features #9 and #10).

Almost all of the organic artefacts came from this level, including all of the harpoon heads (see Appendix C, Figure 34).

Table 29: Summary of artefact and level associations

ARTEFACT CLASS	LEVEL 2	3U	3	3A	3L
Endblade:					
side-notched	35	3	16	27	1
triangular concave-based	8	-	1	1	-
triangular straight-based	7	1	7	4	-
miscellaneous	4	1	2	3	-
fragmentary	14	1	2	3	-
total	68	6	35	43	1
ventral tip-fluted	3	-	1	-	-
dorsal tip-fluted	-	1	-	-	-
total	3	1	1	-	-
Scraper:					
rectangular parallel sided	9	-	8	12	-
rectangular concave-sided	6	-	3	8	-
flake	4	-	2	2	-
triangular	12	1	8	2	-
miscellaneous	1	-	1	2	-
fragmentary	7	-	3	-	-
total	39	1	25	26	-
Burin-like-tool:					
rectangular	6	1	5	6	-
triangular	1	-	2	-	-
angled tip	-	-	1	-	-
fragmentary	7	-	6	11	-
total	14	1	14	17	-
Sideblade:					
ovate	4	-	-	4	-
lunate	-	-	-	1	-
triangular	-	-	1	-	-
fragmentary	1	-	1	2	-
total	5	-	2	7	-
Knife	19	-	10	13	-
Microblade:					
chert	281	23	113	178	5
quartz crystal	11	1	8	12	1
total	292	24	121	190	6

Levels 3 and 3Upper are probably similar to Level 3Lower in representing a leach zone between the upper cultural Level 2 and either the sterile Level 4 or the lower cultural Level 3A and are not in themselves cultural levels. The artefactual and faunal material recovered from these levels probably derived from Level 2 and from Level 3A material that became part of Level 2 during house construction. Feature #3, a small area of ash, was the only feature attributed to Level 3.

Level 2 remains the most difficult level to explain. Level 2 (and Levels 3 and 3Upper) contained relatively more of the variable artefacts and those which appear anomalous in the Groswater context (Table 29, see also Appendix B, Tables 33 to 38). This includes almost all of the triangular concave based and all of the tip-fluted endblades. Features associated with Level 2 include the house depression (Feature #2), two possible faunal concentrations (Features #4 and #7), a concentration of burned chert chunks (Feature #6) and a concentration of chalcedony retouch flakes (Feature #5).

Interpretation of the level requires a closer examination of the house feature (Feature #2). Unfortunately the interior of the house was well cleared of most artefactual material (see Chapter 4.4.2.2). A total of 63 artefacts (excluding retouched/utilized flakes and cores) were located in Levels 2 and 3 within the floor area of the house (Table 30, see also Appendix C, Figures 26-34). Thirty-eight of these were microblades and provide little information. Two knife fragments, four burin-like-tool fragments and one sideblade also came from the floor of the house and suggest Groswater affiliation. The five side-notched and six triangular straight-based endblades as well as the two rectangular, concave sided endscrapers are clearly Groswater artefacts. Finally, both small oval lamps appear to be associated with the house feature. A fragment from one of the small oval lamps was found within the house while the second fragment from this lamp was recovered from Level 2 in the wall area. The second oval lamp came from Level 3 in the inside wall area. It is perhaps of note that none of the problematic artefacts such as tip-fluted endblades came from the floor of the depression. Therefore, the artefactual data suggest a Groswater occupation of the house.

However, the semi-subterranean nature of the dwelling and the date of 1730+/-200 B.P. from the floor are both out of place in a Groswater context. Semi-subterranean houses are first reported in Early Dorset (Fitzhugh 1980a:598; Maxwell 1985:196) (see Chapter 7 for a more detailed discussion of this issue). In addition, even if we accept the earliest range of the 1730 B.P. date (*i.e.* 1930 B.P.), it is still close to two hundred years more recent than the presently accepted end date for Groswater.

Given these various and somewhat contradictory pieces of information, three hypotheses can be presented for the Level 2/Feature #2 occupation at Phillip's Garden East:

1) Level 2/Feature #2 is the result of a brief Middle Dorset occupation at the site.

2) Level 2/Feature #2 represents a transitional phase between Groswater and Middle Dorset.

3) Level 2/Feature #2 is the terminal Groswater occupation of the site.

Table 30: Summary of artefact and Feature #2 association[9]

ARTEFACT CLASS	FEATURE #2
Endblade:	
side-notched	5
triangular concave-sided	-
triangular straight-sided	6
miscellaneous	-
fragmentary	1
Scraper:	
rectangular parallel-sided	-
rectangular concave-sided	2
flake	-
triangular	1
miscellaneous	-
fragmentary	2
Burin-like-tool:	
fragmentary	4
Sideblade:	
ovate	1
Knife	2
Microblade	
chert	37
quartz crystal	1

The first hypothesis argues for a Middle Dorset presence at the site. Some support for this hypothesis can be found in the dates, the semi-subterranean house and certain artefacts. If the more recent range of the

[9] This table only considers artefacts from the floor area of Feature #2 which are most clearly associated with the occupation of the structure. As discussed in Chapter 4.4.1.1, the walls of this feature probably contain a mixture of material from several occupational events and thus their association with the actual occupation of Feature #2 is less clear and of limited use for interpreting the nature of this occupation.

1730+/-200 B.P. date associated with Feature #2 is accepted, this would clearly suggest a Middle Dorset occupation of the house. Semi-subterranean house structures are also widely recognized in Middle Dorset but have not previously been associated with Groswater. As discussed above, the rectangular soapstone cooking pot is considered indicative of Middle Dorset admixture at Phillip's Garden East. The mixing of Groswater material from Level 3A during house construction may have provided enough artefactual material to swamp the few Middle Dorset artefacts and make their recognition in the assemblage more difficult. However, there are too few diagnostic Middle Dorset artefacts in the assemblage to argue for any real Middle Dorset presence at the site. While artefacts such as the triangular concave based and tip-fluted endblades are not clearly Groswater based on present definitions, they are also different from classic Middle Dorset examples. In addition, similar artefacts have been reported from other Groswater sites (see Chapter 7.2.1). None of the artefacts of possible Middle Dorset affiliation was recovered from within the house feature, a fact which makes a Middle Dorset occupation of the feature unlikely. As information on Groswater structures remains very limited, it is somewhat premature to exclude a particular dwelling type from the Groswater inventory. Finally, the other dates from the site suggest that the earlier range of the 1730+/-200 B.P. date is more appropriate. Thus, the evidence for a Middle Dorset occupation at Phillip's Garden East remains very tenuous.

Under the second hypothesis, this occupation is interpreted as representing a transitional phase between Groswater and Middle Dorset on the island. To date, Early Dorset sites have only been found in extreme northern Labrador. Thus, this transitional phase could either be an as yet unrecognized Early Dorset occupation of the island or a transitional phase unique to insular Newfoundland. Once again, the dates as well as certain attributes and artefacts can be used to support this hypothesis. The *ca.* 1900 B.P. dates fall in a period that has been seen as a gap between Groswater and Middle Dorset (Auger n.d.; Tuck n.d.). Artefacts or attributes which show a development towards Dorset include tip-fluted endblades, tabular ground slate tools, triangular endscrapers and the beginning of a soapstone industry. However, the overall differences between terminal Groswater and Middle Dorset assemblages appear too great to allow for a transitional development from Groswater to Middle Dorset without significant outside influence.

The third hypothesis interprets this occupation as the extreme terminal expression of the Groswater phase showing greater experimentation and variability in the artefact assemblage. This may simply be a product of "stress" similar to that proposed for terminal Pre-Dorset groups in other areas of the Arctic (Maxwell 1985) and/or it may be an indication of some Early/Middle Dorset influence. With this hypothesis, the dates from Phillip's Garden East would be accepted as delineating the Groswater occupation of the site with 1900 B.P. marking the end of the phase (see Chapter 4.5). The semi-subterranean house would be considered a valid part of the Groswater occupation. All of the artefacts recovered from the site would also be accepted as belonging to the Groswater phase with the exception of the large rectangular soapstone cooking pot. Nothing similar to this pot has been reported from other Groswater sites but it is identical to examples from Middle Dorset sites such as Phillip's Garden. There is no apparent reason to question the validity of the *ca.* 1900 B.P. dates. As all but one of the artefacts from the site are either clearly Groswater and/or are not clearly Middle Dorset, it follows that these dates are associated with a Groswater occupation. As noted above, given the very limited sample of Groswater structures, there is little reason to exclude semi-subterranean houses from the Groswater phase.

This latter hypothesis extending the Groswater occupation of Phillip's Garden East to 1900 B.P. appears to best fit the available data. These hypotheses and the culture-historical position of the Groswater phase will be examined from a broader perspective in the following chapter.

6.4 Summary

The proposed interpretation of Phillip's Garden East suggests that the main Groswater occupation of the site occurred between *ca*. 2700 and 2300 B.P. This occupation is primarily represented by Level 3A at the site. It contains a large artefact assemblage and abundant faunal material. The artefact assemblage is consistent with present definitions of Groswater material culture. The faunal collection provides the first substantial direct evidence of the Groswater economy. It suggests a strong maritime emphasis at the site with a primary focus on the spring harp seal migration.

A second occupation appears to occur at the site at *ca*. 1900 B.P. as indicated by Level 2 and the house structure (Feature #2). The accepted working hypothesis for this occupation is that it represents the terminal expression of the Groswater phase in Newfoundland. This involves extending the presently accepted end date for Groswater by approximately 200 years and accepting as Groswater some variable material that has not been included in descriptions to date of the diagnostic Groswater artefact assemblage. The amount of faunal material recovered from this level is much less substantial than that found in Level 3A but appears to cover the same type of resources and to suggest a similar orientation. Material from Level 3A appears to have been mixed in with Level 2, probably as a result of the excavation of the semi-subterranean house feature. Additional excavation at the site may help resolve the controversial issues related to this occupation.

Chapter 7
Comparisons and Interpretations

7.1 Introduction

This chapter will attempt comparison and interpretation at a number of levels. Initially, the data from Phillip's Garden East presented in the preceding chapters will be compared and combined with that from other Groswater sites in Newfoundland and Labrador with the aim of arriving at an up-to-date, comprehensive, definition of the Groswater Palaeo-Eskimo phase. This will include an examination of the artefact assemblage and postulated settlement-subsistence system and will draw on available Groswater material. Particularly important in this regard will be the site reports from Factory Cove (Auger n.d.) in Newfoundland and the Postville Pentecostal site (Loring and Cox 1986) in Labrador as both of these sites have large, essentially unmixed, Groswater assemblages which have been well described. While many other Groswater sites have been reported, the assemblages from these sites are either very small or have not been fully described in the literature.

Having reached a new definition of the Groswater phase, comparison will be made with earlier and later material in Newfoundland and Labrador. Our present understanding of Palaeo-Eskimo culture history and of the transition between the Early and Late Palaeo-Eskimo traditions in Newfoundland and Labrador will be reviewed in this context. Finally, using a broader perspective, the Groswater phase will be compared with a number of contemporary sites and "cultures" or phases in the Eastern Canadian Arctic and Greenland. This will also involve a discussion of the general models for the transition from Pre-Dorset to Dorset and the implications these models have for the situation in Newfoundland and Labrador.

7.2 The Groswater Palaeo-Eskimo Phase: Inter-site Comparisons

7.2.1 Material Culture

Groswater Dorset was first defined in the literature in 1972. At this time, Fitzhugh (1972:126) outlined the artefact types and traits considered diagnostic of the phase. The Groswater Dorset artefact assemblage included side-notched, plano-convex endblades of small, medium and large "box-based" varieties; large and small lunate sideblades; corner-notched or stemmed bifacial knives; endscrapers with pronounced graving spurs; and chipped and ground burin-like-tools which were frequently side-notched. These traits, combined with an absence of tip-fluting on endblades, the minimal use of ground slate and the apparent absence of rectangular soapstone vessels, set the complex apart from the widely recognized Dorset culture. Also distinctive of Groswater Dorset was the predominant use of fine-grained, colourful cherts for the chipped stone industry.

In the years since this initial description, the definition of Groswater material culture has remained essentially unchanged despite the fact that it was based on only a few sites with very small assemblages. With more recent excavations at the major sites of Postville and Factory Cove and at a number of smaller Groswater components, the number of Groswater artefacts has increased dramatically. Unfortunately, most reviews of

Groswater material culture have been of a summary nature and have continued to concentrate on the main, "diagnostic", artefact types and traits while generally ignoring the wide range of variation present in these collections. With the addition of Phillip's Garden East, an up-to-date, detailed definition of Groswater material culture is not only appropriate at this time, but will also provide an essential base for a re-examination of Palaeo-Eskimo culture history.

The reader should be aware that this review follows the acceptance of the third hypothesis outlined in the preceding chapter and that this hypothesis is extended to the other Groswater sites considered. Thus, with only a few noted exceptions, the material recovered from these Groswater sites is considered to be associated with the phase. More study will be required in order to actually determine whether any of the variable material is indicative of admixture in these sites.

7.2.1.1 Lithic Artefacts

Endblades: Plano-convex, side-notched, endblades remain the most distinctive Groswater lithic artefact. They have been recovered from all major Groswater sites and dominate the endblade class in the collections from Postville (Loring and Cox 1986), Factory Cove (Auger n.d., 1986) and Phillip's Garden East. As already noted, these side-notched endblades come in a variety of sizes and shapes, and the size and placement of the notches themselves is also variable. Fitzhugh (1972:148) has suggested that Groswater side-notched endblades can be divided into three size clusters and further that the small, medium and large endblades would have been used for arrows, sealing harpoons and walrus hunting harpoons respectively, While the wide range of endblade sizes suggests different functions, there is at present insufficient evidence to support such a functional interpretation. Tool reworking, hafting requirements, style and idiosyncratic behaviour may, individually or in any combination, account for the observed variability. The recovery of additional organic artefacts is necessary before the reasons for this variability and the functional hypothesis can be properly evaluated.

While side-notched endblades dominate, a variety of other endblade forms are found in Groswater collections. Triangular endblades may have straight or concave bases and plano-convex or biconvex transverse cross-sections. Leaf-shaped and lanceolate endblades as well as a few endblades on microblades have also been reported from Groswater sites. These un-notched endblades were probably used as inset blades in harpoon heads although no such harpoon heads were recovered from Phillip's Garden East.

The various unnotched triangular forms have been interpreted in different ways. Auger (1986:113-114, Fig. 1, n.d.:86, Fig. XV) developed a seriation of Groswater endblade forms based on his excavations at Factory Cove (Figure 23). He suggests that unnotched biconvex triangular forms occurred early in the sequence. The gradual development of side-notches and the flattening of the ventral surface led to the distinctive plano-convex, side-notched endblades in the late Groswater period. He argues that a unique leaf-shaped point is similar to Pre-Dorset endblades and may be the earliest Groswater form. However, the evidence presented in support of this scheme is very limited. There are few dates from Factory Cove and their correlation with the proposed endblade sequence is less than perfect (Auger n.d.:120-122).

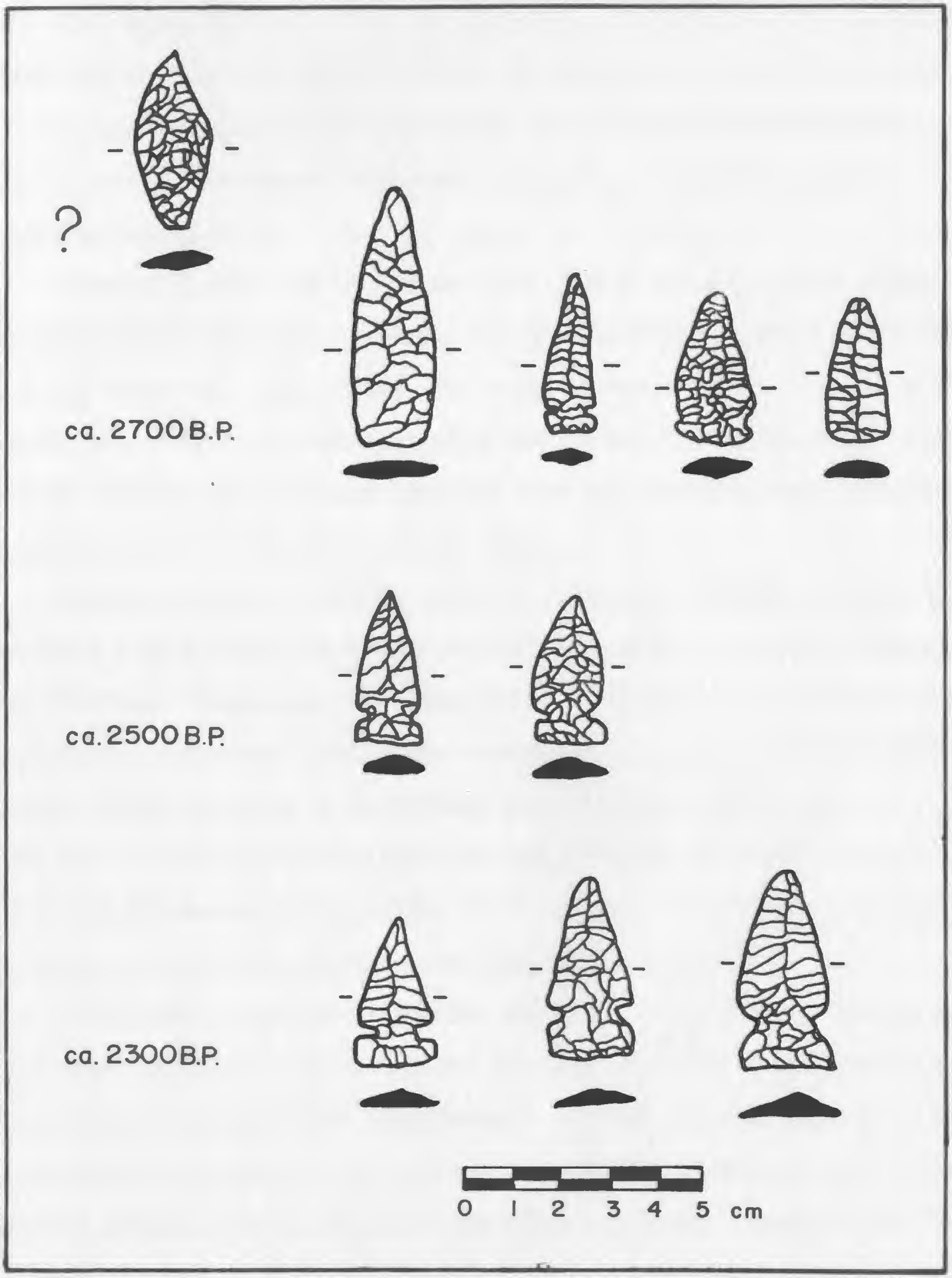


Figure 23: Proposed Groswater endblade seriation (after Auger n.d.:Figure XV)

The complexity of the stratigraphy at Phillip's Garden East prohibited a full evaluation of this hypothesis. Nevertheless, the presence of plano-convex, side-notched endblades in Level 3A at Phillip's Garden East suggests that these endblades may occur relatively early in the Groswater sequence.

Tuck (n.d.:26) has suggested that the triangular, plano-convex, unnotched forms may be preforms, lacking final side-notching. However, many of these endblades have fine edge retouch and a very finished appearance. Adding side-notches after careful retouch of the lateral edges does not seem logical. A more detailed investigation of the manufacturing process for these endblades is clearly required.

Loring and Cox (1986:72) note the presence of biconvex triangular endblades with concave, bifacially thinned bases in the Groswater collection from Postville. They argue that these Groswater triangular endblades have more convex lateral and basal edges than those typical of Early and Middle Dorset. Since Postville is interpreted as a late Groswater site (*ca.* 2200 B.P.), this would suggest that these triangular endblades occur towards the end of the Groswater phase. This is at variance with Auger's argument that biconvex, triangular forms occur early in the sequence.

Various forms of endblades are clearly present in Groswater. More work is required to determine whether these different forms have temporal, functional or other significance. The recovery of harpoon heads from Phillip's Garden East showed that side-notched endblades were indeed harpoon points. While none of the harpoon heads found at Phillip's Garden East were suited for hafting with a triangular, biconvex endblade, the sample is still very small. Additional organic artefacts are certainly required in order to clarify the interpretation of Groswater endblades.

Some of the side-notched endblades from Postville (Loring and Cox 1986:72) and Phillip's Garden East have small areas of grinding on one, usually the ventral, surface. While the reasons for this grinding remain obscure, it may have been to remove minor surface irregularities in order to improve the fit of the endblade against the bed of the harpoon head in the hafting method described above. Small areas of grinding also occur on some of the other endblade forms. None of the Groswater endblades are fully ground.

The absence of tip-fluting on endblades was one of the initial traits which Fitzhugh (1972) and others used to distinguish Groswater assemblages from Dorset ones. However, a small number of tip-fluted endblades have been found in Groswater contexts. Loring and Cox (1986:72) report that two of the side-notched endblades from Postville were tip-fluted on the dorsal surface. As discussed above in Chapter 5, a number of the endblades from Phillip's Garden East were also tip-fluted. While this suggests that the tip-fluting technique was not entirely unknown in Groswater, its frequency of use remains very limited. In addition, some of the tip-fluting found on these Groswater endblades may be accidental and not part of a deliberate manufacturing technique. Finally, the difference between ventral and dorsal surface tip-fluting is unclear although a temporal interpretation has been suggested with dorsal tip-fluting being associated with Early Dorset and ventral tip-fluting occurring in Middle Dorset (Cox 1978). If this temporal sequence is indeed valid, by extension, one might expect dorsal but not ventral surface tip-fluting in Groswater.

Scrapers: In the original Groswater sites, there were few formal scrapers and Fitzhugh (1972:149) argued that retouched flakes would have been used for most scraper functions. More recently, descriptions of Groswater endscrapers have concentrated on one particular form, alternatively referred to as eared, flaring, expanded corner, or as having graving spurs. Once again, while this form does indeed appear to be both common and distinctive in Groswater assemblages, a number of other scraper forms occur. These include endscrapers on blades, rectangular endscrapers (without graving spurs etc.), a variety of triangular forms and endscrapers on flakes. In many collections, these other forms are far more frequent than the distinctive "eared" endscrapers. In addition, within any one form, there are differences in the type of proximal modification involving lateral edge retouch, basal thinning, and/or the production of definite stems and side-notches. Whether these differences are functionally or stylistically significant or are simply the result of varying hafting requirements and use histories is not clear. Once again, the recovery of more organic artefacts might help to clarify some of these issues. In addition, there is a need for more consistency in the terminology used to describe Groswater endscrapers. More detailed use-wear studies would also help to investigate the validity of the "graving spur" argument and the functions for which endscrapers were used.

There are no side scrapers in any of the Groswater collections to date. The back edge of "windswept" burin-like-tools could have served a side scraper function but there is no real evidence that this was the case. While lateral edge retouch is common on many of the endscrapers, this retouch appears to be for hafting purposes as it is generally much more shallow and less regular than that found on the scraper working edge.

Sideblades: Sideblades occur in varying frequency in Groswater sites. They may be circular, ovate or semi-lunate in form and there is a considerable range in size. Small areas of grinding occur on the surface of several of the sideblades from Postville (Loring and Cox 1986:73). As in the case of endblades, this grinding may have facilitated hafting. Here again, suitable hafts have yet to be recovered from any Groswater sites.

Knives: Groswater knives are of innumerable shapes and sizes and are often thin and carefully flaked. Generally they have low, shallow, asymmetric side or corner notches; however, unnotched examples also occur. As with some of the endblades and sideblades, small areas of surface grinding occur on a few of the knives. Two almost totally ground knives from Phillip's Garden East and similar examples from Factory Cove (Auger n.d.:76, Pl. IV:H) are comparable to Maxwell's (1985:143-144) Nanook burin-like knife. They are classed as burin-like-tools by Auger (n.d.:76) and as knives by the present author. Clearly their function is uncertain.

Burins and Burin-Like-Tools: True spalled burins are rare in Groswater collections. Four were reported from Postville (Loring and Cox 1986:74-75), two from Factory Cove (Auger n.d.:75), and none at all from Phillip's Garden East. Burin spalls show a similar distributional pattern with 17 burin spalls from Postville (Loring and Cox 1986:75), none from Factory Cove and only one possible example from Phillip's Garden East. While most spalled burins found in Groswater collections have some amount of surface grinding (Loring and Cox 1986:75; Maxwell 1985:113) those from Factory Cove and two of the examples from Postville were totally chipped (Auger n.d.:75; Loring and Cox 1986:75). Auger (n.d.:107) argues that the spalled burins and burin spalls from Factory Cove indicate an occupation of the site prior to the Groswater phase. Elsewhere, spalled, unground burins are included in the early part of the Groswater phase (Loring and Cox 1986).

In contrast, chipped and ground burin-like-tools are common in Groswater. In his initial definition of Groswater, Fitzhugh (1972:126) described the burin-like-tools as being chipped and ground with asymmetrically notched bases, tabular blades and lateral edges ground for the removal of spalls. Maxwell (1985:113-114) outlines the burin-like-tool manufacturing sequence which he sees as typical of Groswater and other "transitional" phases (see below for a discussion of these transitional phases). In this sequence, the burin-like-tool is first chipped to its basic shape and then spalled. Finally, it is ground but this grinding is not sufficient to remove all traces of the burinated edge, and the small groove resulting from the removal of the spall remains visible. Similarly, Loring and Cox (1986:75) describe some of the burin-like-tools from Postville as being unifacially flaked, spalled and then ground. This differs from the Groswater burin-like-tool manufacturing sequence as it occurs at Phillip's Garden East and Factory Cove where the burin-like-tools show no signs of having been spalled (see Chapter 5.3.3.4 for a full description of these burin-like-tools). However, two possible burin-like-tool spalls were recovered from Factory Cove (Auger n.d.:77) and one from Phillip's Garden East.

The reason for this apparent difference in manufacturing technique is unclear. It does not appear to be temporal as one would expect spalled burin-like-tools to occur in early Groswater sites closer in time to Pre-Dorset with a development of chipped and ground burin-like-tools in the late Groswater period forming a logical progression towards Early and Middle Dorset examples. As Postville is interpreted as a late site and

Factory Cove and Phillip's Garden East both have early dates this does not appear to be the case. The present evidence suggests a geographic distinction with spalled and unspalled forms occurring in Labrador but only unspalled forms on the island. However, there is no other evidence of such a difference in manufacturing technique between insular Newfoundland and Labrador and raw material use patterns suggest a good deal of contact across the Strait of Belle Isle. It should also be noted that the sample size remains limited with only two significant Groswater sites from the island making valid comparison difficult at this point.

In addition to this basic difference in manufacturing technique, burin-like-tools from Groswater sites vary greatly in the extent of surface grinding and the blade shape which may be rectangular, angle-tipped, triangular or windswept. Consistent attributes include some form of side or corner notching and the use of fine-grained, often colourful cherts with virtually no use of nephrite.

Adzes and Miscellaneous Ground Tools: While Fitzhugh (1972:126) recovered tabular and small triangular ground slate scrapers, adze edge fragments, and ground slate knife fragments from the Groswater Bay sites, he found that, in general, the ground slate industry was poorly represented. Adzes were recovered from Postville, Factory Cove and Phillip's Garden East in relatively large numbers and in a variety of shapes and sizes. The smallest adzes from Phillip's Garden East are probably analogous to Fitzhugh's small triangular ground slate scrapers. Phillip's Garden East also produced several ground slate tabular objects which may have been used as scrapers or knives and which are, once again, probably analogous to Fitzhugh's ground slate knife fragments. Ground slate endblades and lances remain absent from Groswater collections.

Hammerstones and Whetstones: Factory Cove is unique among Groswater sites in having a large number of hammerstones and whetstones. Auger (n.d.:68) recovered 73 hammerstones which represented 5.5 percent of the Factory cove lithic assemblage. They were predominantly of pink quartzite and, secondarily, granite. The hammerstones were of a variety of shapes, including elongate, oval, triangular and circular and weighed anywhere from 7 to 436 grams. Auger (n.d.:70) comments on the implications of the large number of hammerstones at the site noting that since most of Groswater lithic manufacturing was accomplished by pressure flaking techniques, hammerstones would only have been used in the initial stages of reduction. Given the location of Factory Cove and the evidence of quarrying activities at the site, the presence of hammerstones is understandable. The absence of hammerstones at other Groswater sites suggests that primary tool reduction was done at the quarry. If Groswater groups from throughout Newfoundland and Labrador were indeed obtaining a significant proportion of their raw material from the Cow Head area through either direct procurement or trade, it is logical that some reduction would be done before moving the material any great distance. This would also explain the more than 300 kg of debitage recovered from Factory Cove (Auger 1986:112). Phillip's Garden East, with a similar sized artefact collection contained slightly over 5 kg of lithic debitage.

As whetstones are generally rare in Early Palaeo-Eskimo collections, the 13 examples from Factory Cove represent a significant number. All of the whetstones were of pink quartzite (Auger n.d.:78). Auger (n.d.:79) distinguishes between active and passive whetstones. The active whetstone was hand-held and moved against the tool being ground while the passive form was held stationary and the tool moved against it. Once again, the relatively large number of whetstones at Factory Cove may relate to primary tool manufacture at the site. The absence of whetstones from other Groswater sites is harder to explain as the final production of burin-like-tools and adzes, and the grinding present on other artefacts would have required some form of whetstone and would undoubtably have occurred at sites other than main quarries. It is possible that the ground tabular objects found at Phillip's Garden East and other Groswater sites may have functioned secondarily as whetstones.

Stone Lamps and Cooking Vessels: Round or oval stone lamps are present, although rare, at a number of Groswater sites. Part of an oval soapstone lamp is reported from the Buxhall site (Fitzhugh 1976a:109). Two fragments of a single oval lamp with flattened ends were found at Postville as well as a lamp preform (Loring and Cox 1986:76). Fragments from two oval lamps were also found at both Factory Cove (Auger n.d.:100) and Phillip's Garden East.

The raw material used for these lamps requires more study. According to Auger (n.d.:100) dolomitic limestone and micaceous schist were used for the two lamps from Factory Cove. He notes that these are rather unusual materials for stone vessels and that their use may indicate that the Groswater inhabitants of Newfoundland had not located soapstone quarries. However, the small "micaceous siltstone" lamp from Phillip's Garden East is virtually identical in size, shape and raw material (based on a visual inspection only) to the finished lamp from Postville which is described as "soapstone". This would suggest that by some definitions, the lamp from Phillip's Garden East is soapstone and, by extension, that Groswater groups on the island did know about soapstone sources or had access to this material through trade. Unfortunately, the lamp fragments from Factory Cove were not available for direct comparison although it seems likely that the "micaceous schist" example will compare favourably with the "micaceous siltstone" lamp from Phillip's Garden East and the "soapstone" lamp from Postville. Obviously there is confusion in the definition and use of the term "soapstone".

The potential of soapstone source identification using rare earth element analysis has been recognized by a number of researchers working in the province and some progress has been made in this area (Allen et al. 1978; Nagle n.d.a; Rogers et al. 1983). Only two soapstone quarries have been located on insular Newfoundland, one at Fleur de Lys on the northeast coast of White Bay, the second near L'Anse aux Meadows (Allen et al. 1978:238; Nagle n.d.a:114). Both of these are relatively easy to access from both Phillip's Garden East and Factory Cove but this does not mean that the Groswater inhabitants of these sites knew of the existence of these quarries. A detailed examination of the raw material used for stone vessels in Groswater sites with a scientific comparison of the different materials and matching with specific source areas would be very valuable. This would answer present questions as to whether the raw materials used in Labrador Groswater sites are the same as those used in Newfoundland. It would also permit an investigation of any differences in the raw material used for Groswater stone lamps and that used by Early and Middle Dorset groups.

The large quantity of fire-cracked rock at Phillip's Garden East and at Factory Cove (Auger n.d.:101) as well as the availability of wood at these sites suggests that heated cobbles may have been used for cooking and heating. Such cobbles can be used in skin or other organic containers. This may help explain the absence of stone cooking vessels in Groswater.

The large rectangular soapstone cooking vessel found at Phillip's Garden East remains anomalous as cooking vessels are not reported from other Groswater sites. It is not considered a valid part of the Groswater assemblage.

Microblades/Blades: Microblades/blades are generally the largest single component of any Groswater lithic assemblage. At Factory Cove microblades/blades account for 31 percent of the artefact assemblage while at Phillip's Garden East and Postville they represent approximately 45 percent of the assemblage. They are made from a variety of cherts and quartz crystal. This is the only artefact class in which quartz crystal is used to any significant extent. Blade width measurements on the microblades/blades from Phillip's Garden East and Factory Cove indicate a unimodal distributional pattern with a peak occurring at 9 and 10 mm respectively. The quartz crystal examples are all smaller and are truly microblades. Groswater microblades/blades are often retouched along lateral edges and hafting modification in the form of stems or side-notches may also occur. Some of the microblades/blades from Postville also exhibit grinding along the lateral edges (Loring and Cox 1986:75). More rarely, retouch occurs along the distal end.

Miscellaneous Lithic Artefacts: Flake perforators such as those from Phillip's Garden East (see Chapter 5.3.3.14) have not been reported from any of the other Groswater sites. However, it is possible that perforators exist in other collections but were not differentiated from the general retouched/utilized flake class. Loring and Cox (1986:76) report an asbestos celt-like object from Postville which they interpret as a wick trimmer. Again, nothing similar has been reported from other Groswater contexts. In all sites, the lithic assemblage includes cores, retouched and/or utilized flakes, preforms, blanks and debitage.

Lithic Reduction Sequence: The Groswater lithic reduction sequence has been described as unique. Tuck (n.d.:27-28) suggests that the first step is to detach a large flake which is then thinned by the removal of large flat flakes until the piece is suitable for further modification. Only when the blank has been thinned is it shaped into the desired tool form. In certain instances, most notably bifacially flaked knives, the final form of the artefact may be dictated by the shape of the thinned blank. As such, it is possible to distinguish blanks from preforms. Final finishing of Groswater stone tools was probably accomplished by pressure flaking. On the basis of this distinctive lithic reduction sequence, Tuck argues that it is possible to distinguish Groswater tools from Indian and more recent Palaeo-Eskimo ones even at the initial stage of manufacture.

A large workshop component was evident at Factory Cove as blanks, preforms or unfinished tools represented 36 percent of the tool assemblage and an additional 87,006 flakes were recovered (Auger n.d.). In analyzing the material from Factory Cove, Auger (n.d.:26) argued that,

> Since this research aims to define an Early Palaeo-Eskimo phase in Newfoundland, for the purpose of comparison, it seems preferable to concentrate on the finished tools; the unfinished artifacts from Factory Cove have no counterparts in any Palaeo-Eskimo collection known to the author and are therefore considered, for the time being, useless for comparative purposes.

The lithic debitage from both Phillip's Garden East and Postville (Loring and Cox 1986:76) is almost entirely of small biface thinning and pressure retouch flakes with few primary reduction flakes. This would suggest that initial lithic reduction occurred elsewhere. If Tuck's proposed sequence is correct, reduction to the blank stage may have been done at the quarry site. These blanks would then have been formed into the needed tools at other locations as necessary. A detailed comparison of the debitage from Factory Cove and Phillip's Garden East would permit the investigation of this hypothesis as present evidence suggests that the vast majority of the lithic raw material from Phillip's Garden East originated in the Cow Head (Factory Cove) beds. Similarly, a comparison of the debitage from Factory Cove and Phillip's Garden East with that from the Middle Dorset site of Phillip's Garden which also appears to have used the same quarry would provide important information on the cultural distinctiveness of the Groswater lithic reduction sequence.

Lithic Raw Material Use Patterns: The lithic raw material associated with Groswater has already received considerable attention (see Chapter 5.3.2). While I have criticized earlier attempts at defining, locating and naming the "typical Groswater chert type", it is clear that the Groswater peoples had a propensity for using fine-grained, often colourful, cherts of good quality. All the present evidence indicates that these cherts originated in deposits along the west coast of Newfoundland and the material recovered from Phillip's Garden East and Factory Cove indicates use of the chert outcrops at Cow Head.

While Fitzhugh (1980b:26) has described the chert in Labrador Groswater sites as being similar to the material from Cow Head, Nagle (n.d.:110) has emphasized the similarities to material from the Cape Ray Light site which is further south along the coast of Newfoundland and contains chert which is generally lighter in colour than the cherts from Cow Head. A source in the Port au Port Peninsula area has been proposed for the material from the Cape Ray Light site (Nagle 1986, n.d.); however, survey in this area has failed to locate any significant outcrops (Simpson, n.d.). In addition, the Cape Ray Light site is predominantly a Middle Dorset site.

The chert sources from western Newfoundland were not used exclusively by Groswater peoples. The raw material in the Middle Dorset collections from Phillip's Garden, Point Riche and Broom Point is essentially the same as that recovered from Phillip's Garden East, although there may be some preference in the Groswater assemblage for the lighter, more colourful Cow Head varieties.

Obviously, more investigation of "Groswater Dorset chert" and "Cow Head chert" is needed. This work should attempt to identify specific source areas using techniques other than simple visual inspection. Only then will it be possible to discuss different patterns of chert use both within Groswater assemblages and between Groswater and other groups. The present evidence indicates the possibility of long distance trade and contact both within Newfoundland and between Newfoundland and Labrador. In addition, the use of cherts from the west coast of Newfoundland by Groswater groups in Labrador gives us the first clear evidence of trade from insular Newfoundland to Labrador as opposed to the well established trade of Ramah chert from Northern Labrador to insular Newfoundland during many prehistoric periods. Further, if Newfoundland cherts are found in the earliest Labrador Groswater sites, there are clear implications for the development of the Groswater phase in Newfoundland and Labrador. Indeed, Cox (1988:3) has recently reported a Groswater site in the Okak Bay area of northern Labrador dated at *ca*. 2900 B.P. which contains Newfoundland cherts.

In addition to these fine-grained colourful cherts from the west coast of Newfoundland, Groswater lithic components contain small amounts of Ramah chert, other cherts and chalcedonies, soapstone, quartz, granite, sandstone and various forms of silicified slates and schists. While fine-grained colourful cherts are by far the dominant lithic raw material type in most Groswater assemblages, there is some regional variation. For example, Ramah chert is the predominant raw material in the Groswater collections from Saglek (Tuck 1976:94) and other sites in northern Labrador. Following standard distance decay models (*cf.* Nagle n.d.) one would expect more use of Ramah chert at Groswater sites in northern Labrador and more use of Cow Head chert in Newfoundland. At Postville Ramah chert comprises approximately 30 percent of the assemblage. Loring and Cox (1986:78) argue that the use of Ramah chert becomes significant in the late Groswater period, indicating a temporal as well as a spatial dimension to the prevalence of Ramah chert in Groswater. Once again, more investigation of this hypothesis is required. If Groswater developed in Northern Labrador, we would expect a more extensive use of Ramah chert to occur in the early part of the phase. In addition, according to the generally accepted chronology (see below), Early Dorset groups were well established in Northern Labrador at the time of the late Groswater phase. Thus, if Groswater use of Ramah chert increases towards the end of the phase, this would suggest contact between Groswater groups in southern Labrador and Newfoundland and Early Dorset groups in northern Labrador. Once again, this has implications for Palaeo-Eskimo culture history in the province.

7.2.1.2 Organic Artefacts

The only Groswater organic artefacts recovered to date are those from Phillip's Garden East and described in detail in Chapter 5. Clearly these few artefacts represent only a small fraction of the Groswater organic artefact component. As the discussion of the lithic artefacts in the preceding section has indicated, we are missing appropriate hafts for many of the Groswater stone tools.

7.2.2 Settlement and Subsistence

7.2.2.1 Dwelling Types

Fitzhugh's original Groswater sites were small lithic scatters without any evidence of associated structures (Fitzhugh 1972:126). Subsequently, mid-passage dwellings with slab or cobble flooring were found at the Labrador Groswater sites of Buxhall and Dog Bight L-5 (Fitzhugh 1976a:109, 1976b:130). However, it was not until the work at Postville in 1977 that Groswater architectural features were actually excavated. A number of "floors" of contiguous stone slabs containing interior features such as box-hearths and alcoves were uncovered at Postville. In addition, there were several isolated box-hearths and mid-passage structures (Loring and Cox 1986). While axial structures appear to be associated with these Labrador Groswater sites (Cox 1978:104; Tuck n.d.:29), the evidence from insular Newfoundland is more ambiguous and a wider range of structure types have been found. At Factory Cove, Auger (n.d.) excavated several bi-lobate structures which seemed to lack these diagnostic traits; however, this may simply be due to the disturbance of the site. Auger (n.d.:61) also found evidence of a possible tent ring, a shallow depression and a wind break or lean-to. The one house located at Phillip's Garden

East, described in detail in Chapter 4, was a shallow, roughly circular, depression approximately three metres across.

Given this variability, we cannot identify a typical Groswater house form. Indeed, the use of house types as cultural markers is complicated by the seasonal and functional dimensions of these features, dimensions which are still poorly understood. To date, we have no good seasonality data for any of the known Groswater structures.

7.2.2.2 Settlement and Subsistence System

The available information on the Groswater settlement and subsistence system is incomplete and therefore confusing. The system has been depicted in different ways by different researchers and at different times. Furthermore, changes in interpretation have been made with seemingly little new information on settlement location, seasonality or resource use patterns.

Fitzhugh (1972) provided the first discussion of the Groswater settlement-subsistence system. As part of the overall Hamilton Inlet research project, he examined the various historic aboriginal patterns of resource exploitation in the central Labrador region. This ethnographic information was used to develop four main prehistoric subsistence-settlement system types which involved varying degrees of dependence on interior and maritime resources. These main types were identified as Interior, Modified-Interior, Interior-Maritime and Modified-Maritime. On the basis of his initial study of the Groswater Bay sites, Fitzhugh (1972:161) proposed a Modified-Maritime system for what he then called Groswater Dorset.

The historic Ivuktoke, or Hamilton Inlet Eskimo, pattern was used as the model for the prehistoric Modified-Maritime settlement-subsistence system. The Ivuktoke were adapted to the unique characteristics of central Labrador which included an arctic maritime environment with the addition of sub-arctic resources. The Ivuktoke followed an annual round involving the exploitation of these various resources as they became seasonally available. In the late winter and early spring, small groups moved out from the Narrows to the islands in Groswater Bay at the mouth of Hamilton Inlet. Seal and walrus hunting were the main foci of subsistence during March. In May, migrating birds were caught and their eggs collected. Fishing for capelin, salmon and trout began in June and continued sporadically into the late summer when cod became the main fish exploited. Shellfish also appear to have been used by the Ivuktoke through the spring and summer. Berries, ripening in August, provided an addition to the diet which otherwise consisted largely of meat. In September and October, the fall bird and caribou migrations were of most importance. This was followed by the fall seal hunt which took place along the newly forming ice edge. In December, these small groups returned to the Narrows where they assembled in larger communities for the rest of the winter. Seals, whales and fish were hunted throughout the winter with fox and caribou exploited from time to time (Fitzhugh 1972:60).

Six different settlement types were associated with this pattern and are described in terms of their archaeological visibility and identifiability (Fitzhugh 1972:61-62). 1) Large permanent winter settlements were located in the Narrows of Hamilton Inlet. Between 50 and 100 individuals would assemble at these sites. They contained semi-subterranean log and earth structures with entrance tunnels and extensive midden deposits. The archaeological visibility of these sites is high and they are readily distinguishable from other settlement types. 2) Snow house settlements were used during winter hunting expeditions both to the *sina* for seals and inland for caribou. As these sites were often located on the ice and left no structural remains they are virtually impossible to identify in an archaeological context. 3) Late winter and early spring sealing settlements were located in Groswater Bay and Lake Melville. These sites contained circular and rectangular tent rings and occasionally duck blinds as the spring bird hunt occurred at the same time. As ice was still present, the sites were not necessarily associated with protected coves or beaches, elements that would be more important at later summer sites. 4) Summer gathering settlements on the islands of Groswater Bay contained large numbers of tent rings and graves. When resources permitted, large groups would gather at these sites. 5) The shores of the Narrows, Groswater Bay and eastern Lake Melville as well as river mouths were ideal locations for summer fishing settlements. Once again, these sites contained circular, and more recently rectangular, tent rings. 6) Finally small bivouac camps contained hearths and wind-breaks. Fitzhugh (1972:62) acknowledged that it is difficult to distinguish between some of these settlement types in an archaeological context although artefact classes, faunal data and specific locations may all provide clues when they are present.

In general terms, the Modified-Maritime settlement-subsistence system involved a coastal settlement pattern with a year-round adaptation to marine resources. Winter ice hunting and open-water sealing were the main subsistence activities. Caribou were important for clothing but only secondarily as a food source and were hunted in the coastal environment, not deep in the interior. Fish, migratory birds, berries and small game were important seasonally. Large, relatively permanent winter settlements were located in the Narrows, while the summer settlement pattern was semi-nomadic and involved the use of more coastal zones (Fitzhugh 1972:161).

Fitzhugh (1972:150) located seven Groswater Dorset sites, all of which were in the inner and outer coastal zones of Groswater Bay. They were interpreted as representing settlement types 3, 4 and 5 (Fitzhugh 1972:150). However, the sites were generally small with few formal tool classes present (five of the seven sites contained fewer than eighty tools, the majority of which were microblades and utilized flakes) (Fitzhugh 1972:149). Therefore identification in terms of the settlement types outlined above seems rather tenuous.

Combining the archaeological data with the Modified-Maritime system model, Fitzhugh (1972:149) outlined the Groswater Dorset settlement-subsistence system as follows. Although winter sites were not located, it was suggested that these sites were probably located in the Narrows and that sealing and caribou hunting were the main subsistence activities. Spring and fall saw an emphasis on the seal and walrus hunts, while in summer the Groswater Dorset relied on birds, eggs, berries and fish. The major differences between the Groswater Dorset pattern and the Ivuktoke one were the absence of a whale hunting specialization and the dog sled in the former. These technological differences may have accounted for the apparent absence of large permanent winter settlements and large summer base camps in Groswater Dorset (Fitzhugh 1972:150).

Subsequent work by Cox (n.d., 1978) in northern Labrador led to a slightly different depiction of the Groswater Dorset settlement-subsistence system. Cox (1978:104) proposed that the winter months were spent deep in the coastal bays with small flexible groups involved in an interior caribou hunt. During the fall and spring, Groswater Dorset groups moved to the inner islands but there was little or no use of outer coastal zones. Thus, Cox (1978:104) described the Groswater Dorset settlement-subsistence system as similar to the Pre-Dorset pattern which was identified as an Interior-Maritime one. As defined by Fitzhugh (1972:159-160) this system involves a generalized winter adaptation to interior resources and a specialized coastal adaptation during the summer months. The coastal economy is more important than the interior one but the coastal specialization is not as intensive as in the Modified-Maritime system described above.

This inner bay/inner island settlement pattern has become the dominant model of the Groswater settlement-subsistence system (*cf.* Tuck n.d.:30; Tuck and Fitzhugh 1986:163-164) despite the fact that there is little supporting data. Fitzhugh's Groswater Bay sites were located in inner and outer coastal zones (Fitzhugh 1972:150). Cox (n.d.) located only one possible Groswater Dorset site in his extensive survey for prehistoric occupations in the Okak area of northern Labrador. In his 1978 article, Cox indicates that the Groswater Dorset settlement-subsistence model was developed in the absence of known winter sites. We have already seen that this was also the case for Fitzhugh's (1972) earlier Modified-Maritime model. Further, it must be emphasized that these models have been developed on the basis of sites with generally small artefact assemblages and no faunal material making interpretation of site function and seasonality extremely difficult.

It is also interesting to note that the depiction of the Groswater settlement-subsistence system seems to be tied to some extent to the current interpretation of Palaeo-Eskimo culture history in the area. When Groswater was interpreted as a Dorset variant (*cf*. Fitzhugh 1972), it was appropriate that it should have a settlement-subsistence system similar to that of Dorset with a strong coastal orientation and specialization. As the similarities between Groswater and Pre-Dorset artefacts were recognized and Groswater began to shift from the Late Palaeo-Eskimo tradition to the Early Palaeo-Eskimo tradition (see below for a detailed discussion of this culture history), its settlement-subsistence system also shifted from one similar to Dorset to one more similar to the proposed Pre-Dorset pattern with a stronger interior focus. To the present author, it appears that there was little actual settlement data to support this shift.

Examining the location, function and seasonality of the three Groswater sites of Postville, Factory Cove and Phillip's Garden East adds somewhat to our understanding of the Groswater settlement and subsistence system, challenges aspects of the Interior-Maritime model and highlights the limits of our current understanding of this phase.

Loring and Cox (1986:77-78) interpret Postville as a base camp in a favoured locale to which a small group returned on a seasonal basis, most likely in the late fall and early winter. They argue that the relatively large and varied artefact assemblage suggests a wide range of activities more typical of a base camp than of a special purpose exploitation camp while the number and variety of structures give the impression of long-term or repeated occupation, perhaps during different seasons. They argue that the site is well situated for exploitation of interior caribou herds and other land resources and that these would have been the primary determinants of site location. However, they also recognize that marine resources would have played an important role in the economy of the Groswater inhabitants of

Postville. During October and November Kaipokok Bay is often filled with migrating harp seal. These seal may become trapped in the bay as land-fast ice begins to form. The large number of harpoon endblades recovered from the site provides additional evidence for the importance of seal hunting. Unfortunately, no faunal material was recovered at Postville. In the absence of actual faunal material it is impossible to determine the relative importance of marine versus terrestrial resources in the economy or to pinpoint the exact season of occupation.

Auger's excavation at Factory Cove also provided new information on Groswater subsistence and settlement, particularly since a small faunal collection was recovered from the site (Table 31). Seal, especially harp seal, dominate the assemblage. Caribou is of secondary importance in terms of meat weights. Other land mammals include arctic hare, beaver and red fox. A number of bird species are also represented. The single cod otolith may simply be a curio or an intrusive element and cannot be used as definitive evidence for fishing at the site (Auger n.d.:130).

The faunal assemblage from Factory Cove suggests a late winter to early summer occupation (Auger n.d.:126). However, if the site was occupied in the spring, there is an anomaly in the faunal assemblage as juvenile harp seal are under-represented. A possible explanation for this anomaly is selective harvesting on the part of the Groswater inhabitants of Factory Cove (*cf.* Cumbaa n.d.:230). However, at Phillip's Garden East the faunal data indicate that all ages of seal were exploited.

Table 31: Faunal material from Factory Cove

SPECIES	NUMBER OF ELEMENTS
Arctic hare	1
beaver	2
red fox	1
caribou	9
harbour seal	27
harp seal	124
seal	413
Canada goose	6
common eider	2
eider	2
murre	1
duck	1
unidentified bird	4
Atlantic cod	1
Total	594

On the basis of the artefact assemblage in conjunction with the radiocarbon dates and structures, Auger (n.d.:125) proposes two different functions for Factory Cove. In the several hundred years of site occupation prior to 2500 B.P., Auger suggests that Factory Cove served as a seasonal exploitation camp focused on the spring seal hunt. After 2500 B.P., the range of artefact classes, the high proportion of lithic manufacturing debris and the variety of structures are interpreted as indicating a year-round occupation and a greater emphasis on quarrying activity. Although the faunal material does not support this suggestion, it is a very small sample and Auger (n.d.:132) argues that it is almost certainly not representative of the full range of species exploited and consequently of the full season of occupation.

In concluding, Auger (n.d.:126) suggests that the Groswater economy was strongly maritime oriented but that it also maintained a secondary dependence on terrestrial resources. Cumbaa (n.d.:227) in his interpretation of the Factory Cove faunal assemblage also emphasizes the maritime focus stating that

> ...the number of these "other" species is so small by comparison with bones of both harp and harbour seals that it reinforces the picture of an almost exclusive maritime economy. Even caribou here are of relatively little importance.

This would suggest a Modified-Maritime settlement-subsistence system following Fitzhugh's (1972) terminology (Auger n.d.:136). Finally, Auger (n.d.:135) proposes that the Groswater people at Factory Cove were collectors (after Binford 1980) with storage and a logistically organized food procurement system. Given this, Factory Cove would have served as a semi-permanent base camp from which special purpose satellite camps were used. For example, Stewart (n.d.:222) argues that caribou would not have used the lowland areas around Factory Cove and that the caribou bones found in the faunal assemblage likely came from a hunting site in the Long Range Mountains.

The data from Phillip's Garden East suggest a seasonal occupation with a primary focus on the spring seal hunt. The large artefact assemblage and the range of dates covering a period of 800 years or more indicate repeated occupation in this favourable locale.

The settlement-subsistence data from these three sites do not appear to fit with the Interior-Maritime model or the proposed inner bay/inner island pattern of site locations which have commonly been presented from Groswater (Cox n.d., 1978; Fitzhugh 1972; Tuck n.d.; Tuck and

Fitzhugh 1986). A number of possible explanations for this situation will be examined.

Fitzhugh's (1972) scheme of settlement-subsistence systems was extremely useful in focusing archaeologists on the economic aspect of prehistoric populations at a time when little attention was paid to such matters and it provided a tool for undertaking such investigations. However, it may not be sensitive enough or appropriate for the uses to which it is now being put. Defining an inner versus outer coastal zone, or even interior versus coastal localities remains problematic. In addition, a site in a seemingly interior location may still have an economy focused on marine resources. This appears to be the case at Postville. Determining the relative importance of terrestrial and marine resources at a given site requires an extremely detailed examination of local resource availability in conjunction with actual faunal material. In the absence of faunal material, it is impossible to know which resources were most important at a given locale. Finally, logically there would be a continuum between a predominantly interior versus a predominantly maritime orientation in Palaeo-Eskimo cultures and the dividing point between an Interior-Maritime system and a Modified-Maritime one is clearly subjective.

Secondly, we may simply lack sufficient data to enable us to depict the Groswater settlement-subsistence system accurately. Here there are limitations in both our interpretive frameworks and in the actual Groswater data base. For example, as Cox (n.d.:298) points out, site location is often used to make statements about seasonality. Interior sites are interpreted as being winter occupations while coastal sites are seen as indicative of a summer occupation. However, the validity of this is highly questionable as the interpretation is based on a single ethnographic pattern which ignores variable cultural responses to the same set of resources. In addition, attempts at determining settlement type which rely on the quantity and range of artefactual material are highly subjective, a point also made by Cox (n.d.:274). We cannot adequately distinguish between the artefact assemblage indicative of long term site occupation through a number of seasons and that resulting from repeated short term occupations over many years (Binford 1980). While it may be possible to identify special purpose camps on the basis of the artefact classes present or to suggest special functions at larger sites, all but the very shortest occupations will result in the use and possible deposition of a wide range of artefact classes. Unfortunately, at present there is little specific function and seasonality data for any of the Groswater sites. Furthermore, we need a good understanding of the technology available to the group. As most of the artefactual material indicative of a specialized maritime hunting technology is organic, until we have a more complete organic component from Groswater, we are limited in the inferences we can make on the basis of the absence of certain artefacts.

Finally, different settlement-subsistence systems must prevail in different areas due to geography and resource availability. We need a detailed survey aimed at locating sites of all seasons and functions in a limited geographic area in order to develop a valid settlement-subsistence system. While sites such as Factory Cove, Postville and Phillip's Garden East provide valuable information in themselves, none of these sites can, at present, be placed in any kind of regional context. In addition, to take a settlement-subsistence system, derived from research in a specific area such as central Labrador and apply it to a cultural phase in general is clearly simplistic. The deeply indented coastline of much of Labrador which resulted in the development of the inner versus outer coastal zone concept is not appropriate for the west coast of Newfoundland which has a largely linear coastline. Similarly, the specific resources present and their pattern of availability differs in Newfoundland, central Labrador and northern Labrador. The spring harp seal migration is extremely important along the west coast of Newfoundland as the seals pass close to shore and are relatively easy to exploit. However, in the fall the seals remain far off-shore. Along the Labrador coast, the harp seals are more difficult to access during the spring migration but, as suggested above, often become trapped in the bays as ice begins to form in the late fall and are easy to hunt at this time. In more general terms, Fitzhugh (1980b:23) notes that compared with Labrador, Newfoundland has very limited interior resources, a point also emphasized by Tuck and Pastore (1986), and as a result any successful pre-historic adaptation to the environment of the island may have necessitated a strong maritime orientation. Given the geographic and temporal extent of the Groswater occupation in Newfoundland, it is clear that they had developed such an adaptation and the strong maritime focus of sites such as Factory Cove and Phillip's Garden East makes sense given the local resources. Taylor's (1966:118) argument of more than twenty years ago is worth repeating here:

> Fundamentally Eskimo economy is neither inland nor coastally adapted but arctic (and to some degree sub-arctic adapted), and the degree to which species are exploited reflects primarily the environment, the faunal resources, and only secondarily an economic heritage.

Attempts at identifying and defining a single Groswater settlement-subsistence system ignore this basic fact and the available data from Newfoundland and Labrador.

What we can say is that Groswater site locations, artefact assemblages and faunal collections all point towards a strong maritime focus in the phase. While Postville, Factory Cove and Phillip's Garden East are larger and more intensively occupied than other Groswater sites, the impression is still one of relatively small, semi-nomadic, groups following a seasonal round. Until we have more sites from all geographic areas which clearly pertain to different seasonal periods, more faunal material and a more complete organic artefact assemblage, any model of Groswater settlement and subsistence must remain an hypothesis in need of further testing.

7.3 The Groswater Phase and Palaeo-Eskimo Culture History in Newfoundland and Labrador

Palaeo-Eskimo chronology in Newfoundland and Labrador was briefly reviewed above (see Chapter 2.3). Here the focus is on the specific period of transition between the Early and the Late Palaeo-Eskimo traditions. This will involve a more in depth examination of the relationship between Groswater and Pre-Dorset on the one hand and Groswater and Early and Middle Dorset on the other.

Groswater Dorset was initially described as a regional Dorset variant occurring in central Labrador (Fitzhugh 1972). Additional work highlighted the distinctiveness of the phase and its separate development from the Early-Middle-Late Dorset continuum in Newfoundland and Labrador; however, for awhile, Groswater Dorset retained its position as the initial Late Palaeo-Eskimo phase (Cox n.d.:260; Fitzhugh 1976b:138). Still more recent work on Groswater sites and a general re-appraisal of Palaeo-Eskimo culture history in Newfoundland and Labrador have resulted in the placement of Groswater at the terminal end of the Early Palaeo-Eskimo tradition (Auger n.d.; Fitzhugh 1980b; Tuck n.d.; Tuck and Fitzhugh 1986).

7.3.1 Groswater and the Early Palaeo-Eskimo Tradition

In Labrador, the Early Palaeo-Eskimo tradition is generally divided into four phases: early Pre-Dorset from *ca.* 3800 to 3500 B.P., late Pre-Dorset from *ca.* 3500 to 3200 B.P., terminal or transitional Pre-Dorset from *ca.* 3200 to 2800 B.P. and finally, Groswater from *ca.* 2800 to 2100 B.P. (Cox 1978). Tuck (n.d.) prefers a slightly different scheme, referring to the early Early Palaeo-Eskimo manifestation in Labrador as Independence I with a subsequent development of Pre-Dorset which in turn evolves into Groswater.

Until recently, Pre-Dorset was thought to be absent from insular Newfoundland but excavations have uncovered a scatter of Pre-Dorset material, indicated primarily by true spalled burins, from Bonavista Bay (Carignan 1975), White Bay (Linnamae 1975) and the south coast (Penney n.d.). Pre-Dorset material has also been found at several of the Port au Choix area sites including Phillip's Garden and the Crow Head cave (Brown 1988; Renouf, personal communication, 1987). The stratified Cow Head site, further south along the west coast, has what appears to be a terminal Pre-Dorset occupation level with a mid-passage hearth and spalled burins among other artefacts (Tuck 1978, n.d.). While this occupation remains un-dated, the stratigraphy suggests a date of *ca.* 3000 B.P. The apparent absence of Pre-Dorset sites on the central and south Labrador coasts may indicate a very rapid southern movement of these peoples (Tuck n.d.:21).

The Early Palaeo-Eskimo tradition is generally seen as involving a continuous occupation at least in northern Labrador (Cox n.d., 1978; Maxwell 1985). While early Pre-Dorset sites are fairly well known from northern Labrador, there is little evidence for occupation during the late Pre-Dorset period (Cox 1978:103; Fitzhugh 1980b:24; Tuck n.d.:16-17; Tuck and Fitzhugh 1986:163). Population expansion is thought to occur with terminal Pre-Dorset, indicated by the move south from northern Labrador to insular Newfoundland.

Most researchers today argue for continuity between terminal Pre-Dorset and Groswater (Cox 1978:104; Fitzhugh 1980a:598, 1980b:24; Tuck n.d.:21; Tuck and Fitzhugh 1986:163-164). Sites in Labrador such as Nukasusutok 2, Shoal Cove 4, Okak-4 and Green Island-6, Area 4 are described as terminal or transitional Pre-Dorset showing a development towards Groswater (Cox n.d., 1978; Fitzhugh 1980b). Typological links between these terminal Pre-Dorset collections and Groswater include small side-notched points, larger side-notched bifaces, ground burins with lateral concavities or notches, and the manufacture of quartz crystal microblades (Cox 1978:104). Further, Cox (1978:104) and Tuck (n.d.:30) argue that the presence of mid-passage features and box-hearths in Pre-Dorset and Groswater suggests continuity between the phases. They also suggest that both phases have a similar settlement and subsistence system. This system is described as having a pattern of inner bay/inner island site locations and a dependence on both terrestrial and marine resources. As such, this Early Palaeo-Eskimo pattern is contrasted with the Late Palaeo-Eskimo or Dorset settlement-subsistence system (see below).

Continuity between Pre-Dorset and Groswater in Newfoundland and Labrador remains the most logical hypothesis; however, the actual archaeological data are still very limited. The artefact collections from the so-called transitional sites are generally small and contain very few diagnostic elements (Cox n.d., 1978; Fitzhugh 1980b; Tuck n.d.).

While mid-passage structures do appear in Pre-Dorset and Labrador Groswater sites, it seems that we should heed Hood's (1986:54) caution that the normative use of dwelling types as cultural markers is hazardous given our present understanding of the possible seasonal and functional significance of house forms. We have already seen that mid-passage structures do not appear in the Newfoundland Groswater sites although the sample remains very small.

The general scarcity of late Pre-Dorset sites and the absence of faunal material make any reconstruction of settlement and subsistence tenuous as well. Until site seasonality can actually be determined and winter sites are indeed found in the proposed interior locations, we are hindered in making comparisons between this Pre-Dorset system and the equally unclear Groswater system (see above). It must also be re-emphasized that the settlement-subsistence system may be significantly determined by the particular resources of the immediate environment and thus considerable variation may occur within any one cultural phase. For this same reason, comparing a Pre-Dorset pattern from northern Labrador with a Groswater pattern from Hamilton Inlet or insular Newfoundland may be of little value.

Finally, there are few dates from Pre-Dorset sites, particularly those related to the terminal part of this phase (Table 32, Figure 24). Shoal Cove 4 is dated at 3005+/-80 B.P. while Nukasusutok 2 has a charred fat date of 3315+/-85 B.P. (Fitzhugh 1980a:598).[10] The Pre-Dorset component from Cow Head remains un-dated (a date of 12075+/-2035 B.P. is rejected) but on the basis of stratigraphic position is slightly earlier than the 2800 B.P. date for the beginning of Groswater at the site (Tuck, personal communication, 1988). Clearly more good charcoal dates are needed in order to confirm continuity between Pre-Dorset and Groswater.

Recently reported work by Cox (1988) at the Nuasornak-2 site in the Okak Bay area of north-central Labrador appears to fill some of the gaps in the Early Palaeo-Eskimo tradition and to provide more evidence of continuity between Pre-Dorset and Groswater.

Even if we accept continuity between terminal Pre-Dorset and Groswater, as Tuck (n.d.:33) points out, the reasons for such a marked population explosion with the onset of Groswater remain a mystery. The great resource potential of the sub-arctic marine environment and the absence of competing Indian groups may be significant factors (Tuck n.d.:33). Once again, these remain hypotheses in need of greater investigation.

10 Maxwell (1985:Table 5.3) corrects the date from Nukasusutok 2 to 2830+/-100 B.P. However, such attempts at correction are problematic (*cf.* Tuck and McGhee 1976) and the usefulness of the date is limited.

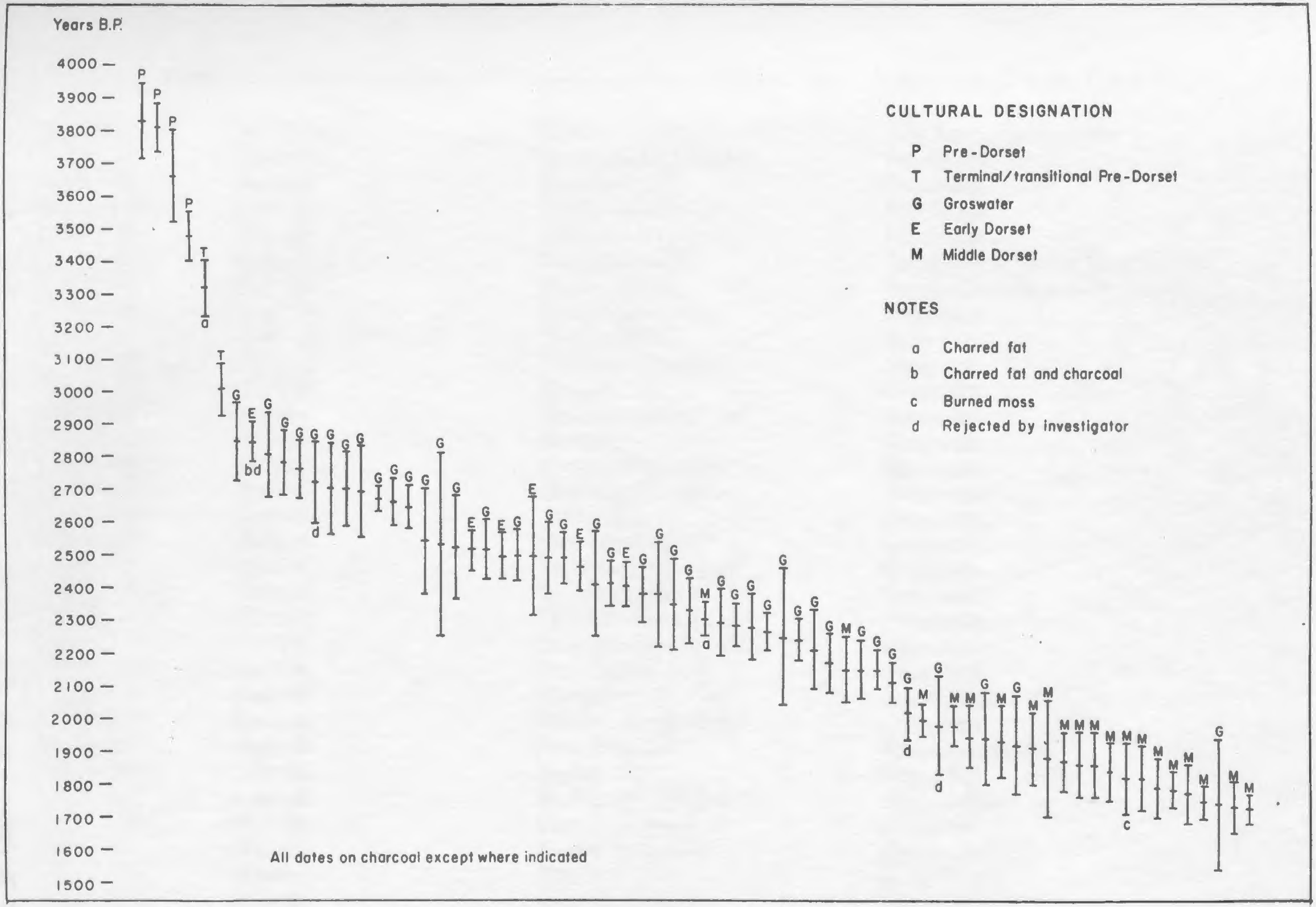


Figure 24: Newfoundland and Labrador Palaeo-Eskimo dates (3900 B.P. to 1500 B.P.)

Table 32: Newfoundland and Labrador Palaeo-Eskimo dates (3800 B.P. - 1700 B.P.)

DATE B.P.	MATERIAL	SITE	CULTURAL AFFILIATION
3830+/-115	charcoal	Rose Island-Q Band 4	Pre-Dorset
3810+/-75	charcoal	Dog Bight L-5	Pre-Dorset
3660+/-140	charcoal	Thalia Point-2 A-19	Pre-Dorset
3475+/-75	charcoal	Okak-6	Pre-Dorset
3315+/-85	charred fat	Nukasusutok 2	Terminal/transitional Pre-Dorset
3005+/-80	charcoal	Shoal Cove 4	Terminal/transitional Pre-Dorset
2845+/-120	charcoal	Cow Head Band 6	Groswater
2845+/-60*	charred fat + charcoal	Iluvektalik Is.-1	Early Dorset
2805+/-130	charcoal	Cow Head Band 5	Groswater
2780+/-100	charcoal	Pittman	Groswater
2760+/-90	charcoal	Phillip's Garden East	Groswater
2720+/-125*	charcoal	Buxhall	Groswater
2700+/-140	charcoal	Factory Cove (Area 1)	Groswater
2700+/-115	charcoal	Cow Head Band 7	Groswater
2690+/-140	charcoal	Ticoralak 2	Groswater
2670+/-40	charcoal	Cow Head Band 7	Groswater
2660+/-70	charcoal	Phillip's Garden East	Groswater
2645+/-65	charcoal	St. John's Island-1	Groswater
2540+/-160	charcoal	Thalia Point 2 A-25	Groswater
2530+/-280	charcoal	Factory Cove (Area 2)	Groswater
2520+/-160	charcoal	East Pompey Is.-1	Groswater
2515+/-70	charcoal	Komaktorvik I	Early Dorset
2510+/-90	charcoal	Phillip's Garden East	Groswater
2495+/-70	charcoal	Komaktorvik I	Early Dorset
2490+/-80	charcoal	Zodiac	Groswater
2485+/-185	charcoal	Rose Island-Q Band 2	Early Dorset
2480+/-110	charcoal	Cow Head Band 5	Groswater
2480+/-80	charcoal	Moose Pasture S1	Groswater
2455+/-75	charcoal	Dog Bight L-3	Early Dorset
2410+/-70	charcoal	Cow Head Band 6	Groswater
2400+/-160	charcoal	Ticoralak 5	Groswater
2400+/-70	charcoal	Dog Bight L-3	Early Dorset

Table 32: Newfoundland and Labrador Palaeo-Eskimo dates (3800 B.P. -1700 B.P.) continued

DATE B.P.	MATERIAL	SITE	CULTURAL AFFILIATION
2370+/-160	charcoal	Phillip's Garden East	Groswater
2370+/-85	charcoal	Cape Ray	Groswater
2340+/-140	charcoal	Ticoralak 3	Groswater
2320+/-100	charcoal	Phillip's Garden East	Groswater
2305+/-90	charred fat	Koliktalik I	Middle Dorset
2285+/-100	charcoal	Broom Point	Groswater
2275+/-65	charcoal	Postville	Groswater
2270+/-100	charcoal	Factory Cove (Area 2)	Groswater
2255+/-55	charcoal	Buxhall	Groswater
2240+/-210	charcoal	Long Island Neck	Groswater
2230+/-65	charcoal	Postville	Groswater
2200+/-120	charcoal	Red Rock Point 2	Groswater
2160+/-90	charcoal	Moose Pasture S1	Groswater
2140+/-100	charcoal	Phillip's Garden	Middle Dorset
2140+/-90	charcoal	Moose Pasture S2	Groswater
2140+/-60	charcoal	Stock Cove	Groswater
2100+/-60	charcoal	Factory Cove	Groswater
2010+/-80	charcoal	Cow Head Band 5	Groswater
1986+/-51	charcoal	Port au Choix-2 (H16)	Middle Dorset
1970+/-150*	charcoal	Broom Point	Groswater
1970+/-60	charcoal	Phillip's Garden	Middle Dorset
1935+/-95	charcoal	Koliktalik 1 (H2)	Middle Dorset
1930+/-140	charcoal	Phillip's Garden East	Groswater
1920+/-110	charcoal	Phillip's Garden	Middle Dorset
1910+/-150	charcoal	Phillip's Garden East	Groswater
1900+/-110	charcoal	Phillip's Garden	Middle Dorset
1870+/-180	charcoal	Frenchman's Island	Middle Dorset
1860+/-90	charcoal	Iglusuaktalialuk 4W	Middle Dorset
1850+/-100	charcoal	Rose Island W	Middle Dorset
1850+/-100	charcoal	Phillip's Garden	Middle Dorset
1830+/-90	charcoal	Koliktalik 1 (H2)	Middle Dorset
1810+/-110	burned moss	DIA-4	Middle Dorset

Table 32: Newfoundland and Labrador Palaeo-Eskimo dates (3800 B.P. -1700 B.P.) continued

DATE B.P.	MATERIAL	SITE	CULTURAL AFFILIATION
1810+/-100	charcoal	Cape Ray	Middle Dorset
1780+/-90	charcoal	Rose Island Q	Middle Dorset
1775+/-55	charcoal	Koliktalik 1 (H1)	Middle Dorset
1760+/-90	charcoal	Koliktalik 1 (H2)	Middle Dorset
1736+/-48	charcoal	Port au Choix 2	Middle Dorset
1730+/-200	charcoal	Phillip's Garden East	Groswater
1720+/-80	charcoal	Koliktalik 1 (H1)	Middle Dorset
1712+/-40	charcoal	Port au Choix 2 (H10)	Middle Dorset

* Date rejected by investigator

7.3.2 Groswater and the Late Palaeo-Eskimo Tradition

As present chronological schemes suggest an Early Dorset occupation in Labrador but not in Newfoundland, we must investigate the relationship between Groswater and Early Dorset in Labrador on the one hand, and Groswater and Middle Dorset in Newfoundland on the other.

7.3.2.1 Groswater and Early Dorset

Early Dorset appears in northern Labrador at *ca.* 2500 B.P., a time when Groswater groups are still present in southern Labrador and on the island of Newfoundland. Groswater persists in these more southern locations for another 400 to 600 years. Most researchers today argue for a lack of continuity between Groswater and the Early Dorset occupation of northern Labrador based on this overlap and what are seen as significant differences in the artefact assemblage, dwelling form and settlement-subsistence system (*cf.* Auger n.d.; Cox n.d., 1978; Fitzhugh 1987; Jordan 1980; Tuck n.d.; Tuck and Fitzhugh 1986). Jordan (1980:414) states

> Early Dorset lithic assemblages in Labrador (*ca.* 500 B.C.) are so nearly identical to those from the Central Arctic core area that their presence can only be explained by new population movements rather than by the introduction of new technologies or ideas to the preceding Groswater Dorset groups.

In a more recent article, Fitzhugh (1987) has commented on Palaeo-Eskimo culture history in Labrador and the Groswater/Early Dorset relationship.

> Of most interest is the strong dichotomy in material culture, raw materials, houses, and settlement patterns between Groswater and Early Dorset phases. Also there is a 300-year time slope between the first appearance of Early Dorset sites in northern Labrador at 2,500 B.P. and its replacement of Groswater culture on the central coast. This boundary is manifested by maintenance of a Groswater isolate that for several centuries resisted assimilation by south-advancing Early Dorset Culture. Whereas other phase transitions in the Paleoeskimo sequence are separated by gaps of several hundred years with few or no sites present, suggesting de-population and new immigration from the Central Arctic (Cox 1978; Fitzhugh 1976, 1980a), the Groswater-Early Dorset transition seems to require an ethnic boundary between Early and Late Paleoeskimo culture. It is significant that Groswater has been classified with Pre-Dorset among the early Paleoeskimo groups while Early Dorset represents a new wave of technological development and adaptation in the Eastern Arctic. (Fitzhugh 1987:147)

Early Dorset artefacts such as ground nephrite burin-like-tools, tip-fluted triangular endblades, multiple side-notched bifaces, nephrite adzes, notched and stemmed slate knives and the high frequency of microblades, circular sideblades and triangular endscrapers are all considered points of contrast with Groswater (*cf.* Cox n.d., 1978; Tuck n.d.). Fitzhugh (1980a:598) and Maxwell (1985:196) both argue that semi-subterranean houses first appear with Early Dorset. In addition, Early Dorset groups are thought to have a much more specialized maritime orientation with greater use of outer coastal zones and minimal use of interior resources (Cox n.d., 1978; Tuck n.d.; Tuck and Fitzhugh 1986:164).

A closer examination of the data, particularly in view of the definition of Groswater presented above, indicates some problems with these general statements. There are indeed some points of similarity between Groswater and Early Dorset artefact types and traits. Tip-fluting on endblades is considered a Dorset trait but, as we have already seen, this technique is present to some extent in Groswater. Loring and Cox (1986:79) note that the notched bifaces and the abundance of microblades in the Postville Groswater collection are traits more indicative of Early Dorset ties than Pre-Dorset ones. All of the major Groswater sites contain large numbers of microblades and some notched bifaces. Maxwell (1985) also considers these traits to be Dorset. While none of the Groswater endblades have the multiple side-notches which appear with Early Dorset, notching of these artefacts does begin with Groswater, suggesting a trend towards Dorset. We also see the beginnings of ground slate and soapstone industries in Groswater, although a real florescence in these technologies only occurs with Dorset. Triangular endscrapers are common in Groswater. Tuck (n.d.:27) has suggested that ventral surface retouch is more common on Groswater triangular endscrapers than on Dorset endscrapers of the same general form. While ventral surface retouch occurs on many of the endscrapers from Phillip's Garden East, only one of the triangular endscrapers at the site was ventrally retouched. Loring and Cox (1986:79) note that while the Groswater ground burins are different from the Labrador Early Dorset nephrite examples, they are very similar to Early Dorset chert burin-like-tools in areas where nephrite is not available such as at the classic Early Dorset T-1 site on Southampton Island. Comparison can also be made between Groswater burin-like-tools and those from the Labrador Early Dorset site of Iluvektalik Island-1 both of which are chipped and then ground with much of the chipping remaining, especially in the proximal section (Cox n.d.:158, Pl. 32a-k).

There are several problems with comparisons between Groswater and Early Dorset artefact assemblages. One is simply that the Early Dorset material remains limited. Almost all of the currently available information on Early Dorset in Labrador comes from Cox's (n.d.) work at Okak. He lists Iluvektalik Island-1 and 2 as the main Early Dorset sites (Cox n.d.). While Iluvektalik Island-1 contained slightly over one thousand artefacts, over 70 percent of these were microblades, tip-flute spalls and utilized flakes. The Iluvektalik Island-2 site consisted of only 30 artefacts, of which 24 were microblades. Thus, there are few diagnostic artefacts on which to base meaningful comparison. A second problem is lack of consistency in artefact classification which makes comparison difficult without viewing first hand all the material. A more fundamental problem is our limited understanding of the significance of certain artefact traits and types. This is an area which has received considerable attention in the general archaeological literature. In the case of Groswater and Early Dorset, the present data are such that a comparison between the two artefact assemblages can highlight either similarities or differences depending on the approach of the researcher. In the absence of precise knowledge of the functional, seasonal, or idiosycratic reasons for different artefact attributes, it remains difficult to determine which ones are truly indicative of cultural similarity or distinctiveness (see Bielawski 1988 for a detailed discussion of this as it relates to Pre-Dorset and Independence I).

Raw material use patterns have also been used to suggest a significant change from Groswater to Early Dorset. Typically, Groswater used fine-grained, colourful cherts which probably originated in the Cow Head beds of western Newfoundland and little Ramah chert, slate, nephrite or soapstone. With the onset of Early Dorset, there is a marked shift in preference to Ramah chert and a significant increase in the use of nephrite, slate and soapstone (Auger n.d.:21; Fitzhugh 1980a:598; Tuck n.d.:30). Given the fact that Early Dorset first appears in and remains confined to northern Labrador, it is logical that they would make use of Ramah chert. While Early Dorset groups in northern Labrador generally appear to be using different raw materials than those used by Groswater peoples, raw material use patterns also provide some evidence for contact between these two phases. We have already seen that Groswater groups in northern Labrador used significant amounts of Ramah, again logical given their proximity to the source of this material. There is also some initial use of slate and soapstone in Groswater. If Loring and Cox (1986:78) are correct that Ramah chert use increases in late Groswater, they would have been obtaining this material at a time when Early Dorset groups probably occupied northern Labrador. Auger (n.d.:152) also notes the significant use of Ramah chert and the presence of soapstone at Postville and suggests that it may indicate contact with Early Dorset groups. Finally, the presence of Newfoundland soapstone in Early Dorset sites in the Okak area (Cox n.d.:37) indicates contact between these two geographic areas and possibly between Groswater groups on the island and Early Dorset ones in northern Labrador.

Contrasting house forms and settlement-subsistence patterns presents many of the same problems highlighted above in the discussion of Groswater and Pre-Dorset. Semi-subterranean dwellings without mid-passages are seen as a distinctive element first appearing in Early Dorset (Fitzhugh 1980a:598; Maxwell 1985:196). Thus, the presence of such a structure at Phillip's Garden East in a Groswater context is anomalous. Likewise, the axial structure at the Early/Middle Dorset site of

Nukasusutok-12 (Hood 1986) appears mis-placed. Axial structures also appear in a Middle Dorset context at Phillip's Garden (Renouf, personal communication, 1988). Once again, the problem of the normative use of dwelling forms remains problematic. However, these data do provide a possible challenge to our present interpretation of Early versus Late Palaeo-Eskimo house styles. Clearly a presence/absence statement is too simplistic.

It will be argued here that we lack sufficient information to compare or contrast Groswater and Early Dorset settlement and subsistence systems. The Early Dorset system is depicted as being more maritime oriented with a greater use of outer islands and outer coastal zones (Cox 1978, n.d.; Tuck n.d.:31; Tuck and Fitzhugh 1986). The relative scarcity of Early Dorset sites and our limited understanding of both systems makes meaningful comparison and contrast difficult at this time.

Finally, the Early Dorset dates remain few and difficult to interpret. In total, there are six published dates for Early Dorset (see Table 32) one of which is on mixed charcoal and fat and is rejected as being too early. The five remaining dates cluster between 2515+/-70 B.P. and 2400+/-70 B.P. The fact that these dates occur in the middle of the Groswater phase remains difficult to explain, even if we accept the argument for geographic separation between these Early Dorset in northern Labrador and Groswater to the south. The earliest Middle Dorset dates are 2140+/-100 B.P. from Phillip's Garden on the island and 1935+/-95 B.P. from Koliktalik 1-(H2) (which also has dates of 1830+/-90 and 1760+/-90 B.P.) in Labrador. However, the beginning of the Middle Dorset phase is generally taken as 1800 B.P. This leaves a considerable gap between Early and Middle Dorset in the province. While this has little direct bearing on the question of Groswater and Early Dorset connections, it does indicate problems in the simple chronology which argues for a lack of contact between Groswater and Early Dorset but continuity between Early and Middle Dorset.

7.3.2.2 Groswater and Middle Dorset

The relationship between Groswater and Middle Dorset in Newfoundland remains slightly more controversial. Interpretations of the Groswater to Middle Dorset period on the island range from no contact or influence to contact but no significant influence to contact and some influence. Tuck (1982:214, n.d.; Tuck and Fitzhugh 1986:165), Auger (1986:112, n.d.:154) and Sawicki (n.d.:148) have argued that the radiocarbon evidence indicates a two to three hundred year gap, beginning about 2100 B.P., between the Groswater and Middle Dorset occupations of the island. This gap, once again combined with what are seen as substantial changes in the artefact assemblage, house forms and proposed settlement and subsistence patterns argues for discontinuity between Groswater and Middle Dorset in Newfoundland. On the other hand, Jordan (1986:142) argues that Middle Dorset groups moving into Newfoundland from Labrador may have encountered remnant Groswater groups, but he maintains that the degree of influence Groswater exerted on the latter was minimal. Fitzhugh (1980b:21, 26-27; Tuck and Fitzhugh 1986:165-166) has also argued for some contact between Groswater and Middle Dorset groups but that Groswater did contribute to the development of Middle Dorset on the island. A final possibility is actual continuity between the two phases.

A re-examination of Palaeo-Eskimo dates along with new dates from the work at Port au Choix calls into question the argument for a significant temporal gap, from *ca.* 2100 B.P. to *ca.* 1800 B.P., between Groswater and Middle Dorset in Newfoundland (Figure 23, Table 32). Dates from Phillip's Garden East suggest that the Groswater occupation of Newfoundland continues until *ca.* 1900 B.P. This proposal receives some support from the 1970+/-150 B.P. date from Broom Point which appeared to be associated with a Groswater occupation but which was rejected as it did not fit with the accepted chronology (Krol n.d.:55) . A number of dates from Phillip's Garden appear to extend the Middle Dorset occupation back to *ca.* 1900 B.P., thus closing the gap.

Comparing the artefact assemblages, house structures and settlement and subsistence patterns for Groswater and Middle Dorset raises many of the same issues discussed above in relation to Early Dorset.

Most reviews of Groswater and Middle Dorset have highlighted the differences between the two artefact assemblages (*cf.* Auger n.d.:Table XXIV). Points of similarity between Groswater and Middle Dorset include tip-fluted endblades, general burin-like-tool forms and triangular endscrapers. The beautiful finely flaked side-notched endblades (knives of type 3-b) which Harp (1964:Pl. VI) recovered from Phillip's Garden may indicate ties between Groswater and Middle Dorset (Maxwell 1985:214; Jordan 1986:140-141). Others have argued that there are differences in the overall dimensions, flaking technique and details of hafting modification between these endblades and those typical of Groswater and therefore that these artefacts cannot be used to argue for continuity (Tuck and Fitzhugh 1986:165). The extremely fine flaking, edge serration and very narrow side-notches of the type 3-b knives are not found on any of the Groswater endblades from Phillip's Garden East. However, there is another possible explanation for these differences. Harp (1964:46) notes that only ten of these endblades were recovered, that all of them came from a very small area at Phillip's Garden and that they may be the output of one particularly skilled flint-knapper. There is some evidence for a Groswater occupation at Phillip's Garden (Renouf, personal communication, 1988) and these endblades may be associated with this occupation rather than the main Middle Dorset occupation of the site. The differences between these endblades and those more typical of Groswater *may* be due to individual workmanship (*cf.* McGhee 1980).

Turning to the question of raw material use patterns, Middle Dorset groups in Newfoundland generally used local chert sources with the result that Middle Dorset on the west coast of the island used the same material as was used in Groswater. While Groswater groups seem to have had a slight preference for the more colourful varieties of Cow Head chert, a much more thorough examination of raw material use patterns will be required to determine accurately whether there are indeed any significant phase-specific differences in the use of this material. With Early and Middle Dorset we do see the first use of nephrite for burin-like-tools and adzes. There is also a significant increase in the use of quartz crystal. In Groswater, quartz crystal when used is almost exclusively for the microblade industry and at Phillip's Garden East only five percent of the microblades/blades are of this material. This percentage rises to 29 at the Middle Dorset site of Phillip's Garden. In addition, quartz crystal is used for other artefact classes in Middle Dorset, most especially endscrapers. While some soapstone appears to have been used in Groswater, a visual inspection suggests that the soapstone found at Phillip's Garden East is from a different source than that used by the Middle Dorset inhabitants of Phillip's Garden. Here again, more detailed studies of raw material identification and sourcing are needed in order to determine whether this impression is indeed valid and whether it holds in other situations.

A comparison of Groswater and Middle Dorset house forms yields the same results as those presented in the Groswater/Early Dorset section and will not be repeated here.

The question of settlement and subsistence patterns is also similar but requires some additional comment. In general, the earlier statements related to our limited understanding of the settlement-subsistence systems of other phases apply to the Middle Dorset pattern as well. Once again, we are in need of more information.

Following Fitzhugh's (1972) scheme of prehistoric settlement and subsistence systems, the Middle Dorset pattern is generally depicted as a Modified-Maritime one with a coastal settlement pattern and a year round adaptation to marine resources (Cox n.d., 1978; Tuck n.d.; Tuck and Fitzhugh 1986). While a strong maritime orientation is clearly evident in Middle Dorset, the limitations of Fitzhugh's models remain (see above).

Krol (n.d.:192ff) describes the Middle Dorset populations of the west coast of Newfoundland, and more specifically those represented at Phillip's Garden, as northern coastal hunter-gatherers (*cf.* Renouf 1984). The maritime orientation is indicated by the coastal site locations, faunal assemblages with a clear emphasis on marine mammals and the artefact assemblage which reflects a specialized maritime technology in the chipped stone endblades, ground stone lances, harpoon heads and barbed points. The extensive nature of Phillip's Garden covering an area of at least 20,000 m^2 with 48 identified house depressions, the suggested presence of both winter and summer house structures and large midden deposits all suggest that the site functioned as a semi-permanent, possibly year round base camp. Stationary features such as interior storage and bone pits and bulky, highly specialized artefacts such as soapstone vessels, large sandstone abraders and sled runners are considered to be additional supporting evidence for this suggestion.

A detailed examination of the Port au Choix area sites will provide extremely valuable data for a comparison of Groswater and Middle Dorset settlement and subsistence strategies. As Phillip's Garden East and Phillip's Garden are adjacent to one another, they provide an ideal test case for examining the economic adaptation of two different phases to virtually identical environments. The detailed analysis of the faunal data, and a full interpretation of site function and seasonality and the broader settlement and subsistence system for both the Groswater site of Phillip's Garden East and the Middle Dorset site of Phillip's Garden is still underway. Preliminary results suggest that there are some major differences between these two occupations and, more generally, between the Groswater and Middle Dorset settlement and subsistence systems.

While Phillip's Garden East and other Groswater sites have a clear maritime orientation (see above) and many of the features considered diagnostic of a Modified Maritime system or of northern coastal hunter gatherers, none of these Groswater sites approach the size and apparent semi-permanent nature of Phillip's Garden. In addition, Groswater appears to lack some of the bulky and specialized technology found in Middle Dorset.

7.3.3 Summary

Resolution of the culture-historical issues related to Groswater and Early/Middle Dorset cannot be reached on the basis of present data. A shared general Palaeo-Eskimo adaptation along with geographic and temporal proximity would suggest that contact occurred between Groswater and Early Dorset groups in Labrador and Middle Dorset groups in Newfoundland and that some influence was exerted, perhaps in both directions. Raw material use patterns and developmental trends evident in some artefact traits provide additional indications of possible contact between these phases.

The evidence for population continuity between Groswater and Dorset or the Early and Late Palaeo-Eskimo traditions in Newfoundland and Labrador remains very tenuous at present. While certain similarities exist in the artefact assemblages from these phases, the overall impression is of significant change with the onset of Dorset.

We need a clearer understanding of the Early Dorset manifestation in Labrador, a resolution of dating uncertainties, and more information on settlement and subsistence systems for Groswater, Early Dorset and Middle Dorset. In addition, we cannot fully investigate this issue without some consideration of what is happening in the Eastern Arctic during this period and how the particular situation in Newfoundland and Labrador relates to or fits with our knowledge of the general transition between Pre-Dorset and Dorset.

7.4 Groswater in the Eastern Arctic Context

7.4.1 The Pre-Dorset/Dorset Transition and the Core Area Hypothesis

In order to consider the arguments related to the transition from Pre-Dorset to Dorset, we must examine the core area hypothesis which has been used as the basic interpretive framework to explain differing regional patterns in this transition. The core area concept as it is used in the Eastern Arctic derives from the work of a number of anthropologists beginning at the end of the eighteen hundreds. Its early roots can be seen in the "geographical provinces" of Adolf Bastian and the work of the German Kulturkreis school (de Waal Malefijt 1974:135). In America, the culture area concept was first suggested by Otis T. Mason in 1895 but it was not until the work of Clark Wissler and his 1917 publication *The American Indian; An Introduction to the Anthropology of the New World*, that the term was more fully developed. In addition to discussing culture areas, Wissler defined the culture centre as the place of early settlement from which the various traits typical of the culture had diffused. With increasing distance from the culture centre, the number of these diagnostic traits diminished. The culture area/culture centre concept was further developed with the work of Kroeber and his 1939 publication *Cultural and Natural Areas of Native North America*.

The core area of Palaeo-Eskimo culture was defined as the Foxe Basin, northern Hudson Bay and Hudson Strait region (Maxwell 1976:5) (Figure 25). It was seen as an ecologically rich and generally stable area which exhibited cultural continuity throughout the Palaeo-Eskimo time period and uniformity in cultural expression. Research in more peripheral areas of the Eastern Arctic suggested a lack of continuity at various times but especially between Pre-Dorset and Dorset. McGhee (1976:15) identified seven "fringe areas" with distinctive Palaeo-Eskimo cultural variants: 1) the High Arctic, 2) the Central Arctic coast and Low Arctic Islands, 3) the western Barren Grounds of the District of Mackenzie, 4) the west coast of Hudson Bay and the adjacent eastern Barren Grounds, 5) the eastern Hudson Bay area, 6) Labrador, and 7) Newfoundland. Taken together, these data were used to suggest cycles of population development in the core area with expansion into fringe areas followed by extinctions or retreats back to the core area. Such movements were generally correlated with periods of climatic change with movement into fringe areas occurring during favourable climatic periods (Cox 1978; McGhee 1972, 1976; Maxwell 1985:50-51).

Figure 25: Proposed core area of Pre-Dorset and Dorset development

Excavations at core area sites such as Igloolik (Meldgaard 1960, 1962), Lake Harbour (Maxwell 1962, 1973) and, to a lesser extent, at the Arnapik and Tyara sites (Taylor 1968) and at T-1 (Collins 1956) have all provided information on the Pre-Dorset to Dorset transition. Data from these excavations have resulted in various and often contradictory interpretations of the nature of the transition and the degree of continuity between Pre-Dorset and Dorset. Maxwell (1984:363) argues that today,

> There is general agreement among archaeologists working in the area that Dorset culture emerges from Pre-Dorset without the introduction of distinctive cultural features from outside the Eastern Arctic or the immigration of a new population.

Even if we accept continuity, an assumption which will be examined in greater detail below, controversy persists with interpretations of the nature of this transition "ranging from a radical shift in subsistence activities and material culture to so gradual a change only an arbitrary boundary separates them" (Maxwell 1980a:169). Maxwell's own interpretation has shifted from viewing the whole Palaeo-Eskimo period from 4000 B.P. to 1000 B.P. as one of relative homeostacy as suggested by his early work at Lake Harbour to describing the Pre-Dorset to Dorset transition as "an interregnum between two phases of dynamic equilibrium" (Maxwell n.d.:5). Meldgaard's (1960, 1962) initial work at Igloolik led him to suggest discontinuity between Pre-Dorset and Dorset, with Dorset culture emerging as a result of a population migration. After subsequent work at Igloolik, he is reported to have concluded that there is indeed continuity but that the sites from the 24 to 22 metre terraces (*i.e.* those belonging to the transitional period) showed evidence of a population under stress with experimentation and rapid stylistic change, especially in non-lithics (Maxwell 1976a:3).

Continued research has resulted in more data and a questioning of the core area hypothesis by some researchers. According to the traditional model, Labrador would be considered a fringe area. However, on the basis of work in northern Labrador, Cox (n.d., 1978:114) has suggested that the gaps presently appearing in the Palaeo-Eskimo occupation sequence in this area are due to the limited amount of research. He further suggests that

> During the period from 4000 to about 2500 B.P., there appears to have been an eastern cultural evolutionary sequence largely distinct from that of the core area, although during some periods such as terminal Pre-Dorset there was probably some degree of communication between areas. This eastern sequence includes the eastern High Arctic and Greenland Independence I, Independence II and Sarqaq cultures, and the apparently related Labrador Pre-Dorset and Groswater Dorset cultures. In area, it includes northern Greenland and the Eastern High Arctic islands, the Baffin Bay and Davis Strait areas, and northern Labrador. At least the southern half of this area parallels the central core area in being resource rich, and probably capable of supporting continuous human occupation. There are, however, important differences between the two areas which might be expected to produce differing adaptive strategies (Cox 1978:114).

While tentatively suggesting this second core area, Cox (1978:114-116) also notes a number of problems with this interpretation. While population continuity may be proven within both the Early and Late Palaeo-Eskimo traditions, there still appears to be discontinuity between them. Furthermore, while contemporaneous cultural manifestations within this area show marked similarity, they lack the homogeneity apparent within the central core area. The amount of population movement into and out of this area remains uncertain, as do the exact boundaries of the area. In concluding, Cox (1978:115-116) suggests that,

> A more profitable approach may involve placing emphasis on regional development both within and outside the central core area, without at the same time

> denying a high degree of similarity and cultural communication between some areas. It eventually may prove that there were a number of regional centers of cultural development, each supported by a rich local resource base which allowed for long-term continuous occupation.

Schledermann (1978b) has used his data from the Bache Peninsula region of Ellesmere Island to suggest population continuity and an *in situ* development from Pre-Dorset to Dorset in this area, a proposal which also challenges the traditional core area hypothesis. Schledermann's comments, although ten years old and related to a different geographic area seem particularly relevant to the present Groswater situation.

> The accumulating evidence strongly suggests that the Pre-Dorset/Dorset transition occurred in different places, perhaps during slightly different time periods, resulting in regional expressions which may or may not conform completely to what we stereotypically think of as "true" Early Dorset. Some cultural elements may appear earlier in one place, later in another and perhaps not at all in a third... In a vast geographical region such as the North American Arctic, variation within the same general culture stage should be the norm rather than the exception (Schledermann 1978b:473).

As Maxwell (1980a:169) noted "Increased information has complicated rather than resolved our view of the Pre-Dorset to Dorset transition". This statement may well be an indication that the model into which we are trying to fit the data related to this transition is inadequate. The above review suggests significant problems with the core area hypothesis. A more flexible approach is required which takes into consideration the different environments and resources of the various "fringe areas", the possibility of multi-directional contact between different geographic areas and the likelihood of variation across such a vast region.

The confusion associated with this transition is readily apparent with an examination of the terminology used to designate various cultural manifestations during this period. Late Pre-Dorset, terminal/transitional Pre-Dorset, Independence II, Groswater (Groswater Dorset) and Early Dorset are all designations which are currently used to describe material from this period, with different terms often used for similar assemblages. The following section will examine the relationship between Groswater and contemporaneous phases across the Eastern Arctic.

7.4.2 Inter-Phase Comparisons

Groswater has generally been compared with the Independence II manifestation in Greenland and the High Arctic (*cf.* Auger n.d.:158; Cox 1978:106; Fitzhugh 1976c:115; McGhee 1981:34). Artefact traits such as flaring endscrapers, side-notched endblades, ground and notched burin-like-tools, and oval or disk-shaped sideblades, occur in both phases (*cf.* Maxwell 1985:119-121; McGhee 1981). While soapstone and tip-fluted endblades were originally thought to be absent from both, round or oval soapstone vessels, and the occasional example of tip-fluting are now recognized in assemblages from both of these phases (Maxwell 1985:121). With the addition of an organic component in the Groswater collection from Phillip's Garden East, we also see important similarities in the harpoon heads of Groswater and Independence II. The open or slightly flanged sockets, gouged line holes with a longitudinal orientation on the dorsal surface and a horizontal orientation on the ventral surface and basal spurs of the Groswater harpoon heads compare well with those described by Knuth (1968:64-65, Fig. 2) from Greenlandic Independence II sites and from the Lonesome Creek site on northern Ellesmere Island. In addition, one of these harpoon heads (Knuth 1968:65. Pl. II:7) has a "sunken tip-face to support an end blade" similar to that found on two of the examples from Phillip's Garden East. The Independence II harpoon heads from Port Refuge are also similar in general form but their essentially closed sockets which are pierced from the dorsal surface suggest a further development towards Dorset (Maxwell 1985:121; McGhee 1981). Dwelling forms with mid-passages and paved wings are also similar in the two phases (Cox n.d.:335-336, 1978:106; Maxwell 1985:117) as is the supposed settlement-subsistence system with a terrestrial and maritime focus, although the validity of such comparisons remains questionable as discussed above in another context.

In addition to the clear ties between Independence II and Groswater, both of these phases have been compared to a variety of terminal Pre-Dorset, transitional and Early Dorset sites throughout the Eastern Arctic (cf. Cox 1978, n.d.; Maxwell 1985). Independence II harpoon heads are generally considered to be similar to Meldgaard's types A-8 to A-12 which are found on the transitional terraces at Igloolik. Meldgaard (unpublished notes) also illustrates several harpoon heads with a sunken bed or platform for the endblade; however the provenience of these harpoon heads is not clear. Cox (n.d.:337-338) has argued that Groswater's closest ties to the central core area are with terminal Pre-Dorset sites such as the 24 metre terrace at Kapuivik (Jens Munk). Similarities include notched bifaces, small ground burins and flared endscrapers. Maxwell (1985:111-121) has emphasized the similarities between Groswater, Independence II and the Killilugak site at Lake Harbour. He argues that the artefacts from this latter site show a mixture of Pre-Dorset and Dorset traits. Parallels with Groswater include the distinctive spalled and ground burins which are found in Labrador Groswater sites (see above), sideblades, side-notched endblades, and endscraper forms (Maxwell 1985:Fig. 5.16)

Helmer (1980) describes the Karluk Island site as essentially Early Dorset dated between *ca.* 2500 and 2200 B.P. and with close ties to Independence II. Similarities with Independence II include broadly side-notched endblades, large ovate sideblades, flaring endscrapers, rectangular vessels, cloven-hoof lance heads and the absence of ground slate and semi-subterranean houses. On the other hand, the Karluk Island narrow side-notched, triangular tip-fluted and multiple side-notched endblades, Dorset Parallel and Tyara sliced harpoon heads, tapered flint flakers and the absence of mid-passage structures are traits which set it apart from Independence II and suggest closer ties to Early Dorset (Helmer 1980:437). Many of these traits, both those shared with Independence II and those seen as different, are found in Groswater. In addition, as Maxwell (1985:188) notes, the presence of high side-notched endblades and of the distinctive Groswater/Killilugak type burin-like-tool are particular points of similarity between Karluk Island and Groswater. Finally, the two Tunit open socket harpoon heads from Karluk Island are very similar to the harpoon heads from Phillip's Garden East. Helmer (1980:437-438) in turn compares Karluk Island to Early Dorset sites such as the Ballantine, Ferguson, Buchanan and Joss sites on Victoria Island and Bernhard Harbour on the adjacent mainland (*cf.* Taylor 1972) and to the Tyara (*cf.* Taylor 1968), Tanfield (*cf.* Maxwell 1973) and T-1 (*cf.* Collins 1956) sites. Traits such as narrow side-notched and tip-fluted endblades, side-notched burin-like-tools, small ovate sideblades and tapered flint flakers occur at both Karluk Island and these Early Dorset sites. Many of these traits also occur in Groswater.

Schledermann (1977, 1978b) compares his Longhouse and Baculum sites on the Bache Peninsula of Ellesmere Island with Independence II and transitional Pre-Dorset/Dorset material. At the Longhouse site, a harpoon head of Type A-10 is similar to ones found in Independence II contexts and also to examples from the 24 metre terrace at Igloolik (Schledermann 1977:245). At the Baculum site , notched bifaces, sideblades, chipped and partially ground burins and Tyara sliced harpoon heads suggest a transition from Pre-Dorset to Dorset (Schledermann 1978b:462). Similarities to Groswater can be seen in the Type A-10 harpoon head and in the transitional lithic artefacts.

At the Lagoon site on Banks Island, Arnold (1981) has recovered harpoon heads with beds for the endblades and rectangular open sockets. In other attributes however, particularly the basal ends, these harpoon heads are very different from the Groswater examples. The Lagoon site contains a confusing mixture of Pre-Dorset and Dorset traits such as spalled burins, burin-like-tools, sideblades, side-notched and stemmed endblades and transverse edged scrapers in addition to some western Norton and Choris influence (Arnold 1981). Some of this material is comparable to Groswater (Maxwell n.d.).

At the Turngasiiti 2, 4 and 5 sites on the Belcher Islands, Harp (1976b) excavated material very similar to Groswater including side-notched endblades, symmetric bifaces, lunate and rounded side-blades, flared endscrapers, notched and ground burins and hearth boxes.

Finally, a number of sites contain a scatter of one or more artefact forms typical of Groswater. For example, at the earliest Dorset levels of Nunguvik on northern Baffin Island, Mary-Rousseliere (1976) has recovered a few endblades with high side-notches and box-bases identical to those found in Groswater.

Summarizing this material as it relates to Groswater presents a complex picture as some Groswater artefacts and traits appear more closely related to Pre-Dorset while others suggest ties with Early Dorset. In addition, while there are definite similarities with Independence II there are also differences between these two phases. Side-notched endblades and bifaces are considered a Dorset trait but are found in terminal Pre-Dorset, Groswater and Independence II as well as Dorset. However, the typical Groswater high, narrow, side-notched endblades, while found in a number of late Pre-Dorset and Early Dorset sites, are not found in Independence II. Flared endscrapers occur in Pre-Dorset, Independence II and Early Dorset as well as Groswater but appear most common in Groswater and Independence II. Burin-like-tools which are spalled and then ground occur in Labrador Groswater and at the transitional Killilugak and Kapuivik (24 metre terrace) sites but not in Independence II. Maxwell (1985:114) contrasts this type of burin-like-tool manufacturing technique with the Dorset technique in which the working edge is steeply retouched and then ground. However, this latter technique is also used in Groswater. The Nanook burin-like knife which Maxwell (1985:176) also describes as an artefact type first appearing in Early Dorset is in many ways similar to the ground chert knife or burin objects from Phillip's Garden East and Factory Cove. A high proportion of microblades is considered a Dorset trait, but so is a high frequency of quartz crystal use for this artefact class. Groswater collections have a large number of microblades/blades but the use of quartz crystal is relatively limited. The open sockets of the Groswater harpoon heads suggest ties to Pre-Dorset but the gouged line holes argue for the loss of the bow-drill and a Dorset connection. In general, the Groswater harpoon heads are most similar to Independence II examples but are also similar to terminal Pre-Dorset (Meldgaard's types A-8 to A-12) forms and to the Tunit Open Socket type from the Early Dorset Tyara site (Taylor 1968). Finally, according to traditional views (but see above 7.2.2.1) the Groswater axial structures and box-hearths are Pre-Dorset forms but the semi-subterranean dwelling from Phillip's Garden East is similar to Early Dorset.

Thus, we have a long list of sites, stretching from Victoria and Banks Islands in the west to Newfoundland in the east, and from southern Hudson Bay in the south to northern Ellesmere Island and northern Greenland in the north and covering the time period from *ca.* 3000 B.P. to *ca.* 2000 B.P. which show many similarities but which have been ascribed to various cultural phases. This suggests a certain amount of contact or information exchange throughout the entire Eastern Arctic during this period.

We can gain some insight into the Groswater problem by considering Independence II. In many ways, Independence II and Groswater are analogous manifestations. Both occur during the same general time period. Both have been regarded as regional phases, Independence II present in the High Arctic and Greenland, Groswater in Newfoundland and Labrador. Both share some traits with Pre-Dorset and others with Dorset. Both have been linked at various times with either of these major phases while Independence II has also been considered an independent cultural manifestation distinct from other contemporaneous cultures and with ties to Independence I suggesting a separate line of cultural development. In addition, Groswater's closest ties appear to be with Independence II. Once again, Schledermann's comments are worth quoting.

> It would appear that the Independence II phase developed at approximately the same time as the overall Pre-Dorset/Dorset transition. The presence or absence of specific traits, in particular the changing harpoon head styles, on sites from this general time period may be related to the temporal span of the various "Independence II" settlements. Early "Independence II" occupations may reflect late Pre-Dorset influences, and later "Independence II" occupations may reflect early Dorset influences (Schledermann 1978a:56).

Maxwell, in a paper presented at the Canadian Archaeological Association meetings in 1984, provided further insights into the issues related to Groswater, Independence II and the transition from Pre-Dorset to Dorset. The paper set out to consider whether the Groswater phase is

> A) a discrete episode in the developing continuum between Pre-Dorset and Dorset; B) a dramatic manifestation of cultural change between the two configurations, or C) a third cultural configuration distinct from both Pre-Dorset and Dorset (Maxwell n.d.:2).

Combining the information from Groswater, Independence II and other sites of this general time period, Maxwell (n.d.:4-5) develops a list of typical artefacts. The most distinctive is the small, rectangular, "windswept" burin which is spalled and then polished and the resulting burin spalls. These burins are found at Killilugak, Tikoralak, Thalia Point and Igloolik. With time, these burins become larger and more ovoid as at Postville, Avinga and Turngasiiti. Endblades are corner and side-notched with the high side-notched, box-based forms being particularly distinctive. Triangular, unnotched endblades are absent or rare. Oval side-blades and oblique-edged and flaring-edged scrapers are common. Oval soapstone lamps occur only rarely. In some places the use of nephrite, slate knives and polished burin-like-tools make their first appearance. There is very little evidence for drills or bows and arrows. Although few non-lithic artefacts have been recovered from this period, a tremendous range of variation is present. Mid-passage structures are recognized in some, but not all, areas during this period.

Taking this data as a whole, Maxwell (n.d.:6) suggests that the stress and experimentation which Meldgaard felt was present in the transitional period at Igloolik was more pronounced in so-called marginal areas. He concluded with three alternative explanations for the Groswater phase.

> 1) Eastern Paleoeskimo prehistory encompasses the co-traditions of two ethnic groups with regionally differing Mongoloid origins -- the earlier of the two referred to as Independence people who ultimately became assimilated into the majority populations after Postville time, essentially 250 B.C. This, I believe is the direction McGhee is trending. 2) Groswater/Independence II are regional expressions of a more central developing trend toward Dorset culture. In at least central Labrador, and possibly Sarqaq, this regional expression provides sufficiently adaptive techniques that it can persist long after the traits of Dorset have become more widespread. This, I think, is suggested by Fitzhugh when he defines Groswater Dorset, at least in earlier statements, as "an evolved Pre-Dorset form influenced by Dorset traits developing elsewhere but not ancestral to later Dorset in Labrador". And 3) an attempt by Pre-Dorset people throughout their distribution area to restore an upset balance between man and nature. The experimentation in this attempt which may have been as much ideological as technical and strategic, is reflected to us only in certain old and new artifact traits such as seemingly inconsequential changes as oblique-edged scrapers. It is this sort of behaviour that both Arnold and Meldgaard are suggesting.

On the basis of the evidence available in 1984, Maxwell (n.d.) was unable to resolve the Groswater issue.

The problems of dating remain a major obstacle as does the relatively limited amount of work in many areas of the Arctic. Although ties have often been made between climatic and culture change, our limited environmental knowledge and the problems of correlating ill-defined cultural and environmental sequences hinders the validity of such speculations. We certainly lack an understanding of the mechanisms of culture change. In addition, fundamental differences between "lumpers" and "splitters" and the varying perspectives of researchers working in different regions of this vast area are likely to result in continued debate over culture-historical frameworks.

At present, the questions of population continuity between the Early and Late Palaeo-Eskimo traditions in "fringe" areas, the extent of population movement and/or diffusion of ideas between the core area and fringe areas or between different regions, the validity of the core area hypothesis and the effect of climatic change all require further investigation. Clearly such considerations have important implications for our interpretation of the Groswater Palaeo-Eskimo occupation of Newfoundland and Labrador. As Maxwell (n.d.:2) commented, the "period from about 900 B.C. to 500 B.C.... has been an intellectual battleground for the past two and one-half decades and bids to continue for decades hence."

Chapter 8
Summary and Conclusion

The 1986 season of fieldwork at Phillip's Garden East which forms the basis of this thesis was undertaken with three main objectives. These included the recovery of a good artefact assemblage in order to further develop the definition of Groswater material culture, an investigation of the settlement and subsistence system aided by a substantial faunal collection and, finally, a re-examination of Groswater culture history based on any new information obtained from the site. The data obtained permitted the pursuit of these objectives, challenged certain aspects of our present definition of Groswater, highlighted the limitations of our knowledge and suggested areas for future research.

Phillip's Garden East is interpreted as a late winter and spring site focused on the exploitation of seals, particularly the harp seal migration and, to a lesser extent, avifauna. Seal and gull elements indicate processing of the meat for storage. The large artefact accumulation suggests regular re-use of the site. Dates from the site indicate that this re-use occurred over a period of at least 800 years.

Slightly over 1400 artefacts were recovered from Phillip's Garden East, making it one of the largest Groswater assemblages excavated to date. In general terms, this assemblage supports the standard definition of Groswater material culture which has developed since the phase was initially defined by Fitzhugh in 1972. However, a number of lithic artefacts and/or attributes found at Phillip's Garden East do not appear on most trait lists for Groswater. A more detailed examination of available site reports suggests that similar artefacts and/or attributes have indeed been recovered from Groswater contexts but that they are considered to be infrequent occurrences and, treated as insignificant variability, they are excluded from much of the analysis of Groswater material culture. Thus, soapstone lamps, ground slate tools, a variety of endscraper forms other than those with "graving spurs", unnotched endblade forms and tip-fluting on endblades are all found in Groswater. Since "classic" Groswater artefacts such as side-notched, box-based endblades and endscrapers with "graving spurs" are now well recognized, it is time to focus our attention on the variable traits present in the phase, particularly since it is these traits that will be of most use in tracing cultural connections. More specific areas of Groswater lithic technology that require detailed examination include the lithic reduction sequence and lithic raw material use patterns. There is also a need to isolate any temporal or geographic variability within the Groswater lithic assemblage. Auger's (n.d., 1986) endblade seriation is one example but it remains problematic. The two different burin-like-tool manufacturing techniques present in Groswater are another area of variability to be investigated.

The recovery of an organic component from Phillip's Garden East is a significant addition to our definition of Groswater material culture, especially as this very small collection contained six harpoon heads. Harpoon heads appear to be one of the more time sensitive Palaeo-Eskimo artefact classes and are very useful for cultural comparison. The harpoon heads from Phillip's Garden East, which have open or slightly flanged sockets and single gouged line holes, support earlier suggestions that

Groswater is most similar to the Independence II occupations of Greenland and the High Arctic islands (Auger n.d.:158; Cox 1978:106; Fitzhugh 1976c:115; McGhee 1981:34). However, these harpoon heads also show similarities to transitional Late Pre-Dorset/Early Dorset ones from other areas of the Eastern Arctic. Additional harpoon head forms must exist in Groswater as none of those recovered from Phillip's Garden East was suited for hafting with unnotched endblades. Hopefully, more organic artefacts will be found at Phillip's Garden East or other Groswater sites as the present sample is clearly unrepresentative.

The faunal collection from Phillip's Garden East is the first extensive one from a Groswater site. With approximately 30,000 elements identified to date, it far surpasses the 594 elements recovered from Factory Cove (Auger n.d.), the only other Groswater site to yield faunal material. The collection indicates a strong maritime focus in the economy with over 80 percent of the identified elements belonging to seal. This result was to be expected given the site location in relation to available resources; however, such direct evidence for diet is extremely valuable. The very low frequency of land mammals (approximately 0.30 percent of the identified elements) was not expected. Avifauna accounts for approximately 17 percent of the identified elements. The detailed analysis of the faunal assemblage from Phillip's Garden East, which is still underway, is likely to provide more specific information on resource use patterns and butchering techniques in Groswater. Determining whether this strong maritime focus is site specific, representing a seasonal exploitation of the spring harp seal migration only, or whether it represents part of a year round focus on marine resources will require additional excavation of Groswater sites.

The excavation of a semi-subterranean house feature is also a significant development for Groswater. Apart from a shallow depression reported from Factory Cove, most known Groswater architectural features are axial or mid-passage structures. Furthermore, semi-subterranean structures are generally seen as first appearing with Early Dorset. Once again, the data from Phillip's Garden East challenge our present definition of Groswater and point towards a need to re-examine the traditional Early versus Late Palaeo-Eskimo trait list dichotomy.

The examination of site function and seasonality at Phillip's Garden East along with a review of the data from other Groswater sites resulted in a questioning of the current models used to depict the settlement and subsistence system of the phase. On the one hand, we simply lack sufficient information to enable us to accurately portray Groswater settlement and subsistence. On the other, there appear to be fundamental problems or limitations in the approaches that have been used to date. Systematic regional surveys in various areas (*e.g.* northern Labrador, central Labrador, insular Newfoundland) are required at this point. Such surveys would, hopefully, uncover the seasonal round, the relative importance of marine and terrestrial resources, and the range of site types (base camps, special purpose exploitation camps, etc.) used in Groswater.

The dates obtained from Phillip's Garden East argue for a prolongation of the Groswater phase by approximately 200 years beyond the presently accepted terminal date of 2100 B.P. Thus, based on present evidence, Groswater would cover the period from 2800 B.P. to 1900 B.P. Clearly we need more evidence for a Groswater occupation of Newfoundland and Labrador between 2100 and 1900 B.P.

Taken together, the data from Phillip's Garden East was used to suggest limited contact and perhaps influence between Groswater and Early Dorset groups in northern Labrador and Middle Dorset groups on the island of Newfoundland. This remains an hypothesis in need of further testing. Population continuity between Groswater and Dorset or between the Early and Late Palaeo-Eskimo traditions in the province does not appear to occur; however, once again this is an area which requires further research.

A detailed examination of terminal Groswater sites in Newfoundland and Labrador may shed important new light on the Early to Late Palaeo-Eskimo transition in this part of the Eastern Arctic. This in turn has the potential to greatly enhance our understanding of Independence II and the general transition from Pre-Dorset to Dorset in the Eastern Arctic.

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Plate 1: Phillip's Garden East - view to the northeast showing grid placement for excavation

Plate 2: Phillip's Garden East -View to the northwest showing initial excavation area and excavation expansion

Plate 3: Completed excavation at Phillip's Garden East. The four square metre area in the centre right was excavated in 1984. The excavation at Phillip's Garden is visible on the lower terrace in the background.

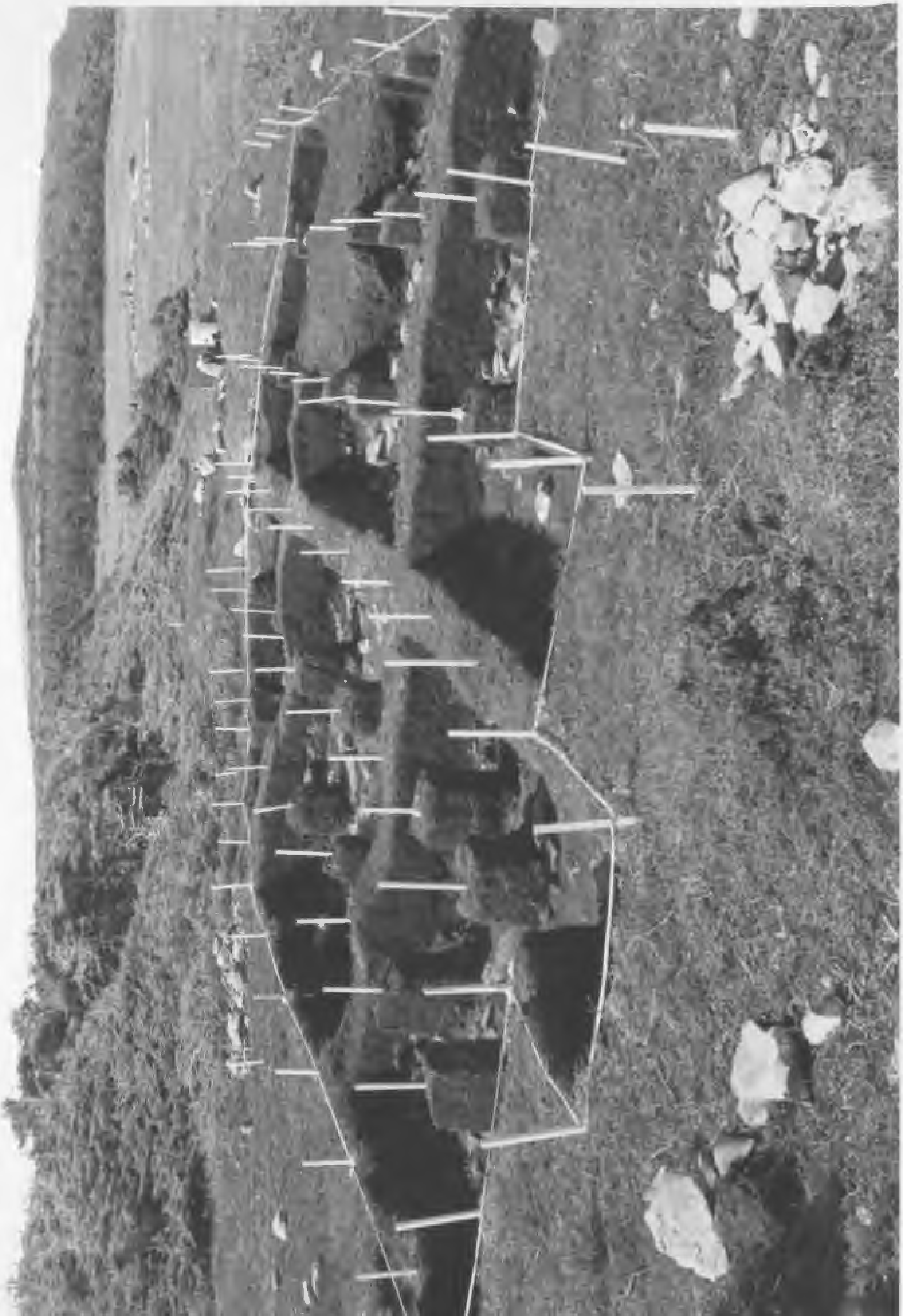

Plate 4: Feature #2 - southwest quadrant looking to the north


PHILLIP'S GARDEN
EAST
FEATURE 2
LEVEL 2
27 JUNE 86

Plate 5: Feature #2 - southwest quadrant

The excavation was expanded towards the top of the photograph in order to uncover the rest of the house depression.


PHILLIP'S GARDEN
EAST
FEATURE 2
LEVEL 2
27 JUNE 86

Plate 6: Profile showing the west wall of Feature #2

In this photograph the typical profile of the house depression is visible. Level 1 is the over-burden of sterile sod and peat, here between 30 and 40 cm thick. The thin grey band below this is Level 2. In the wall area, but not in the depression itself, Level 3A occurs below Level 2. Level 3A is up to 5 cm thick in this area and contains faunal material, fire-cracked rock and numerous artefacts. At the base of the excavation is the sterile sand and limestone cobble beach.


PHILLIP'S GARDEN
EAST
E231 N02
NORTH WALL PROFILE
29 JULY 86
E232 N03

Plate 7: Side-notched endblades

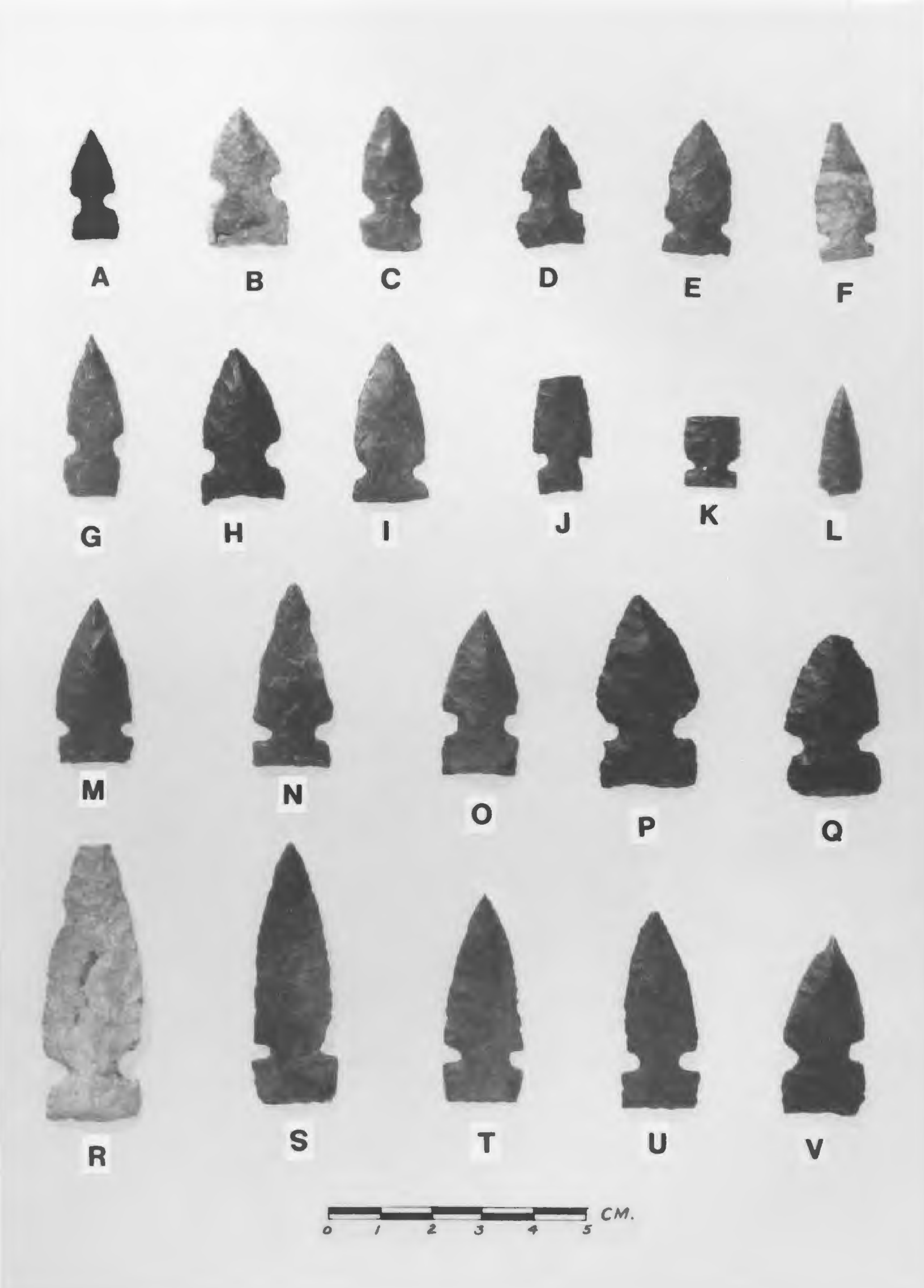
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Plate 8: Unnotched endblades

A-G Unnotched, triangular, straight-based endblades

H-L Unnotched, triangular, concave-based endblades

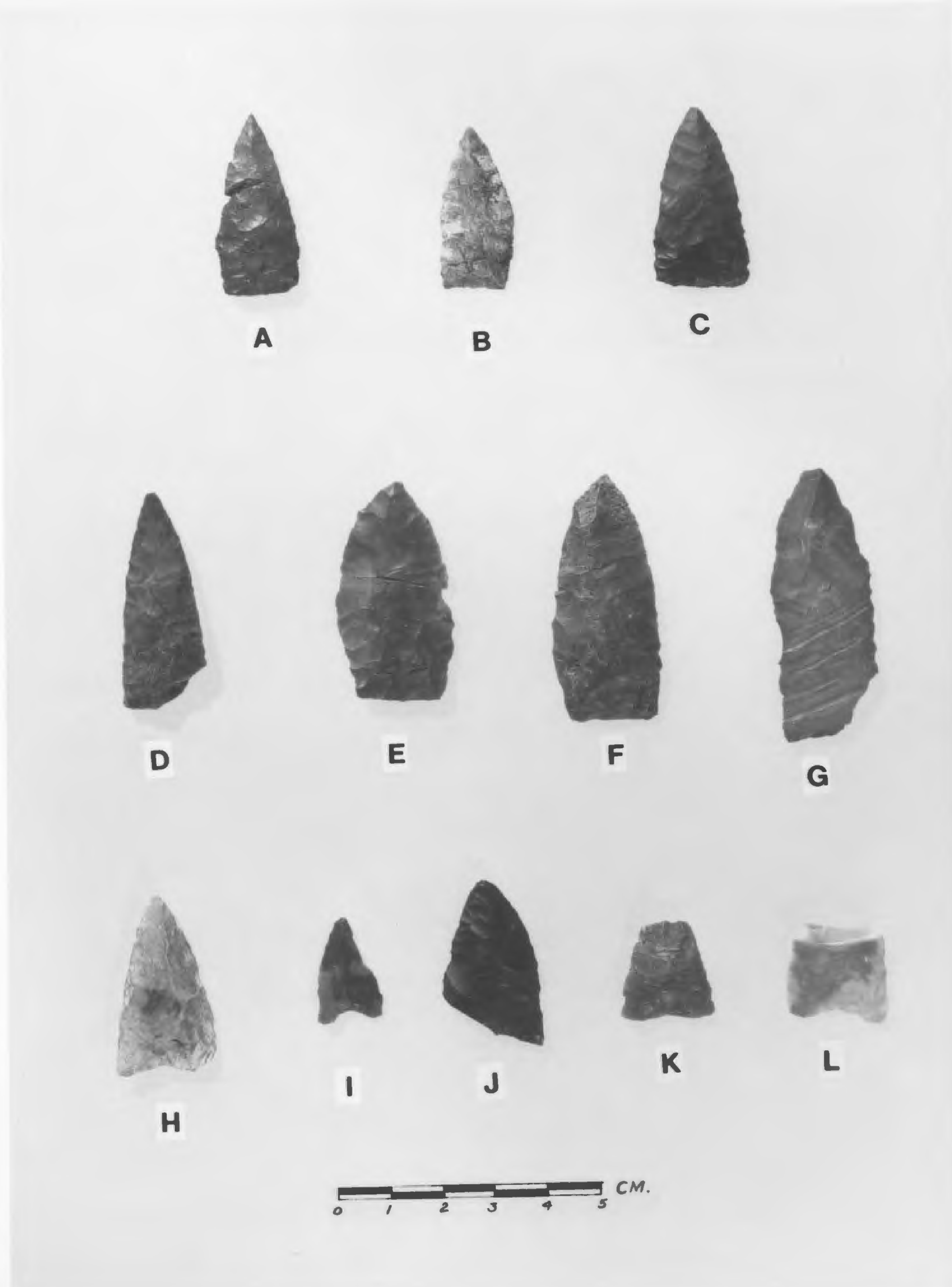
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Plate 9: Miscellaneous endblades

B,I Preforms

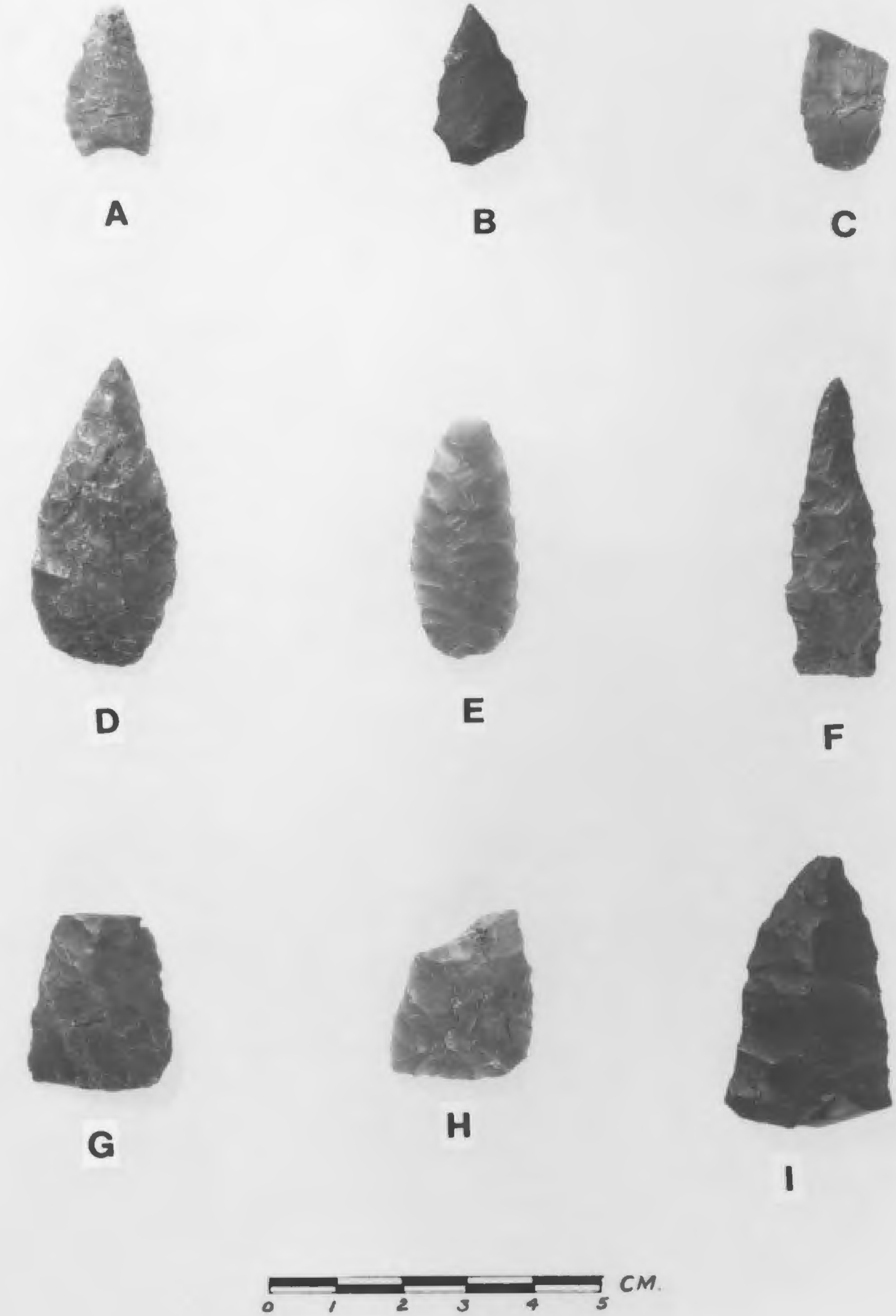
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Plate 10: Sideblades

A-H Ovate

I Semi-lunate

J Triangular preform

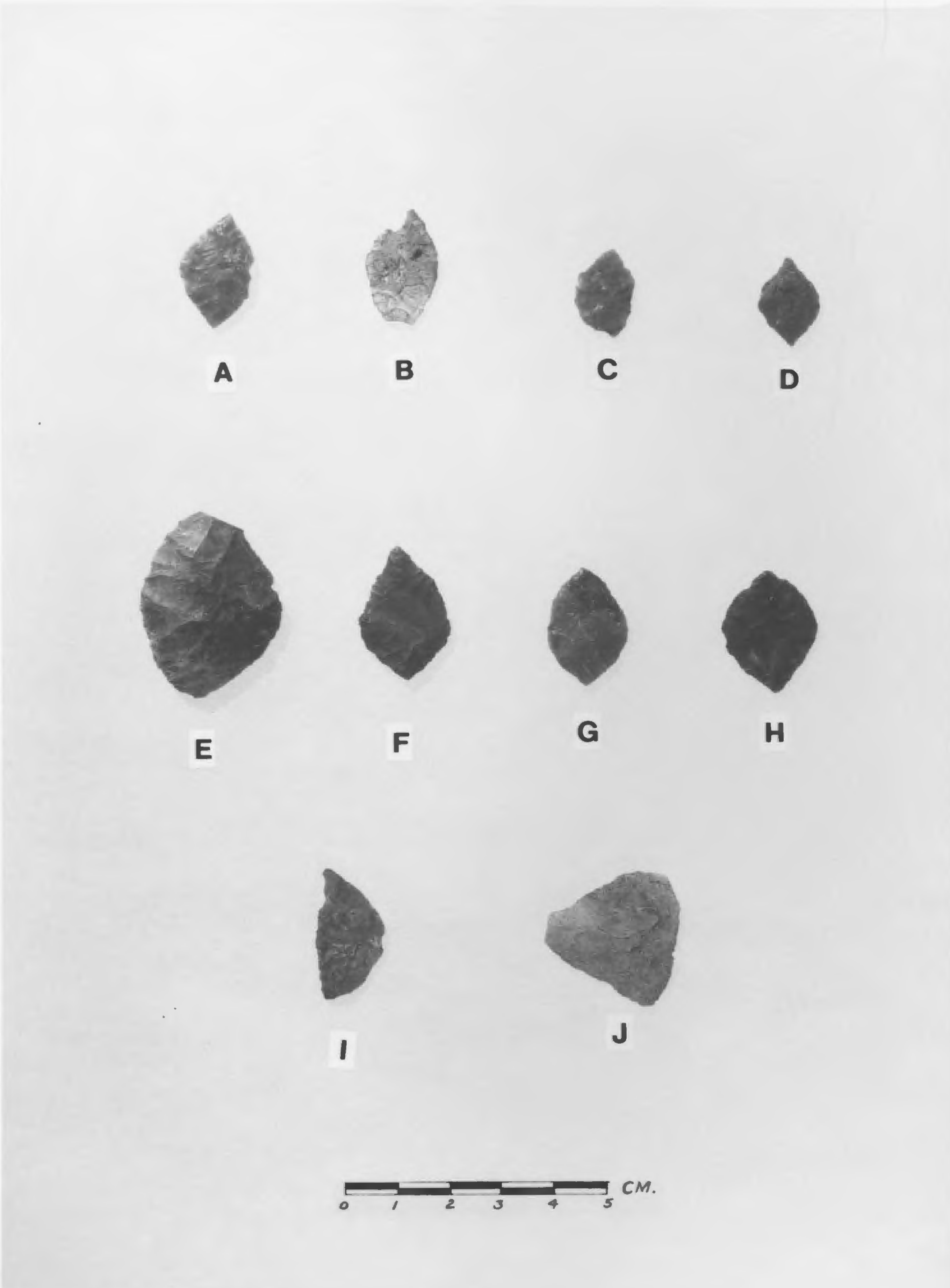
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Plate 11: Knives

A,B Note the extensive grinding present on these two examples.

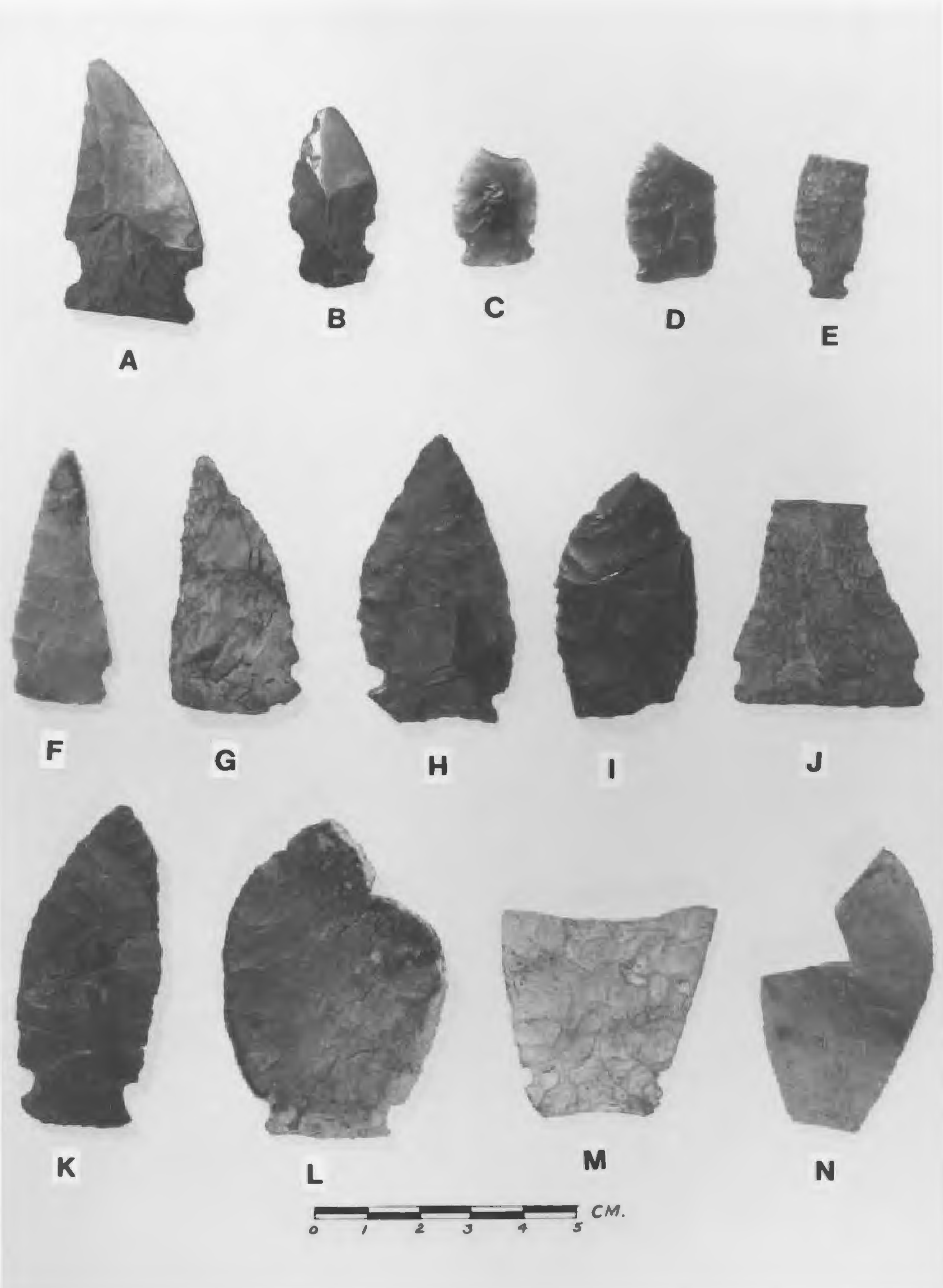
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Plate 12: Burin-like-tools

A-H Rectangular

H preform

I-J Triangular

K Angled tip

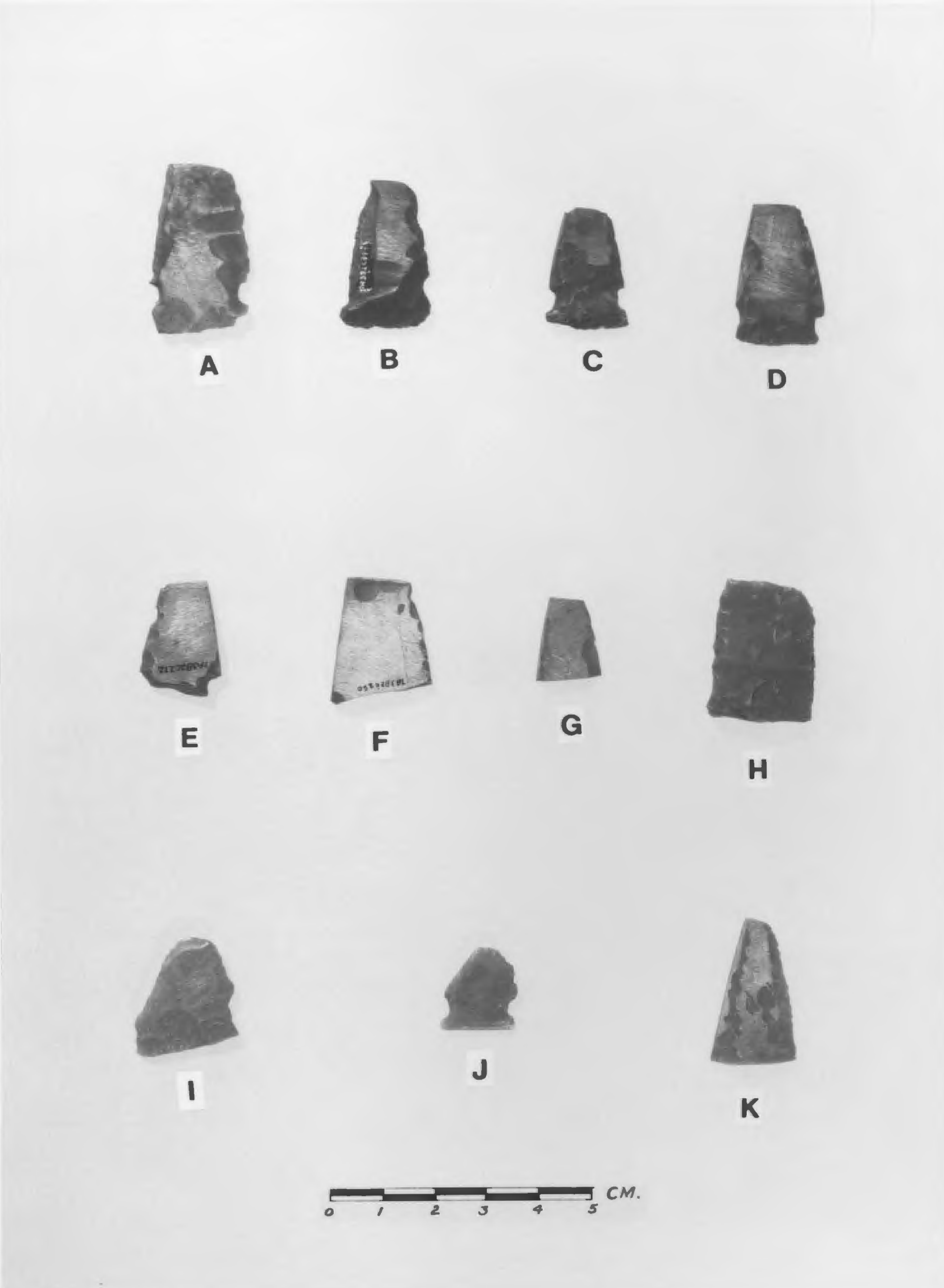

Plate 13: Straight-sided rectangular endscrapers

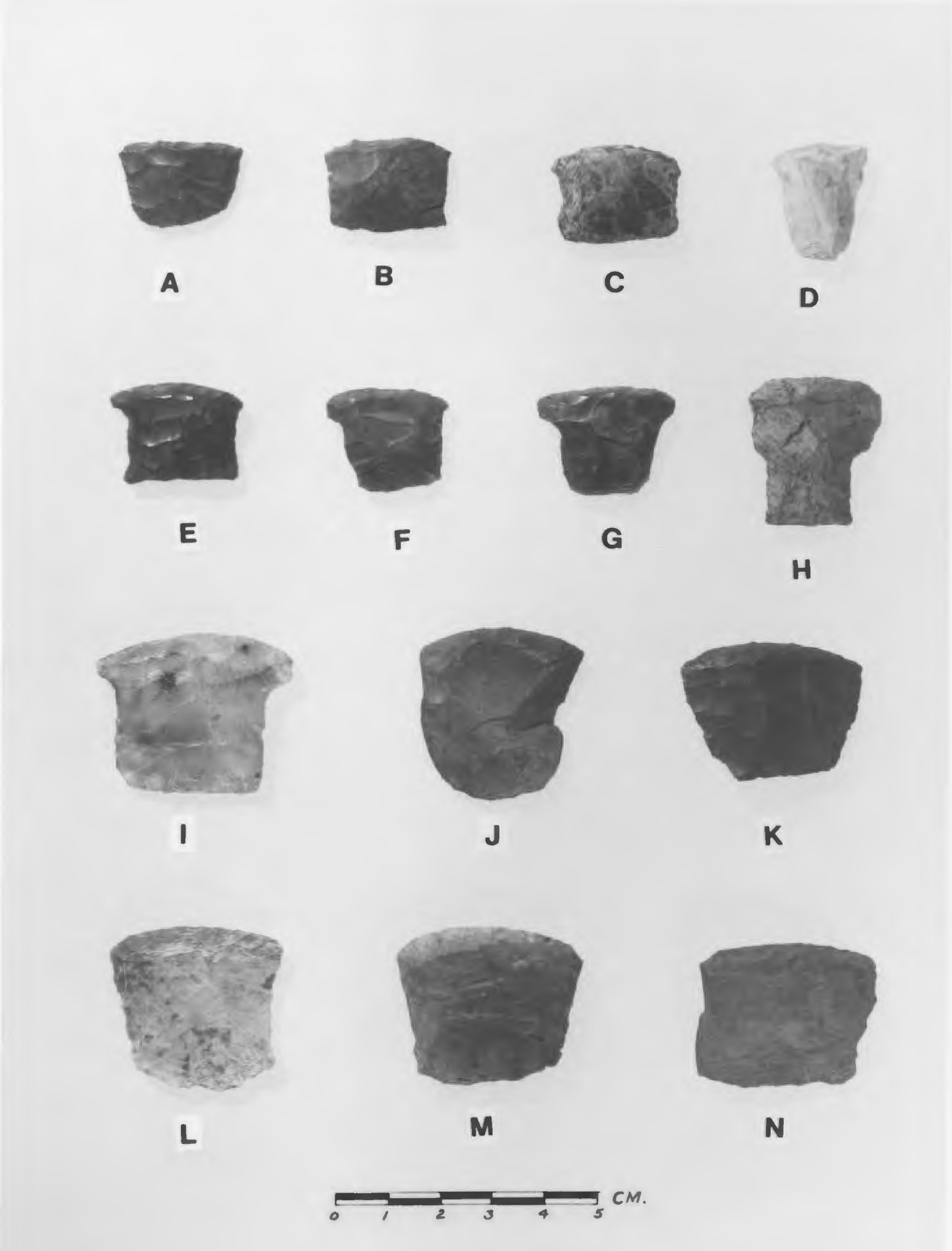
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Plate 14: Endscrapers

A-I Concave sided/side-notched rectangular endscrapers

J-M Flake scrapers

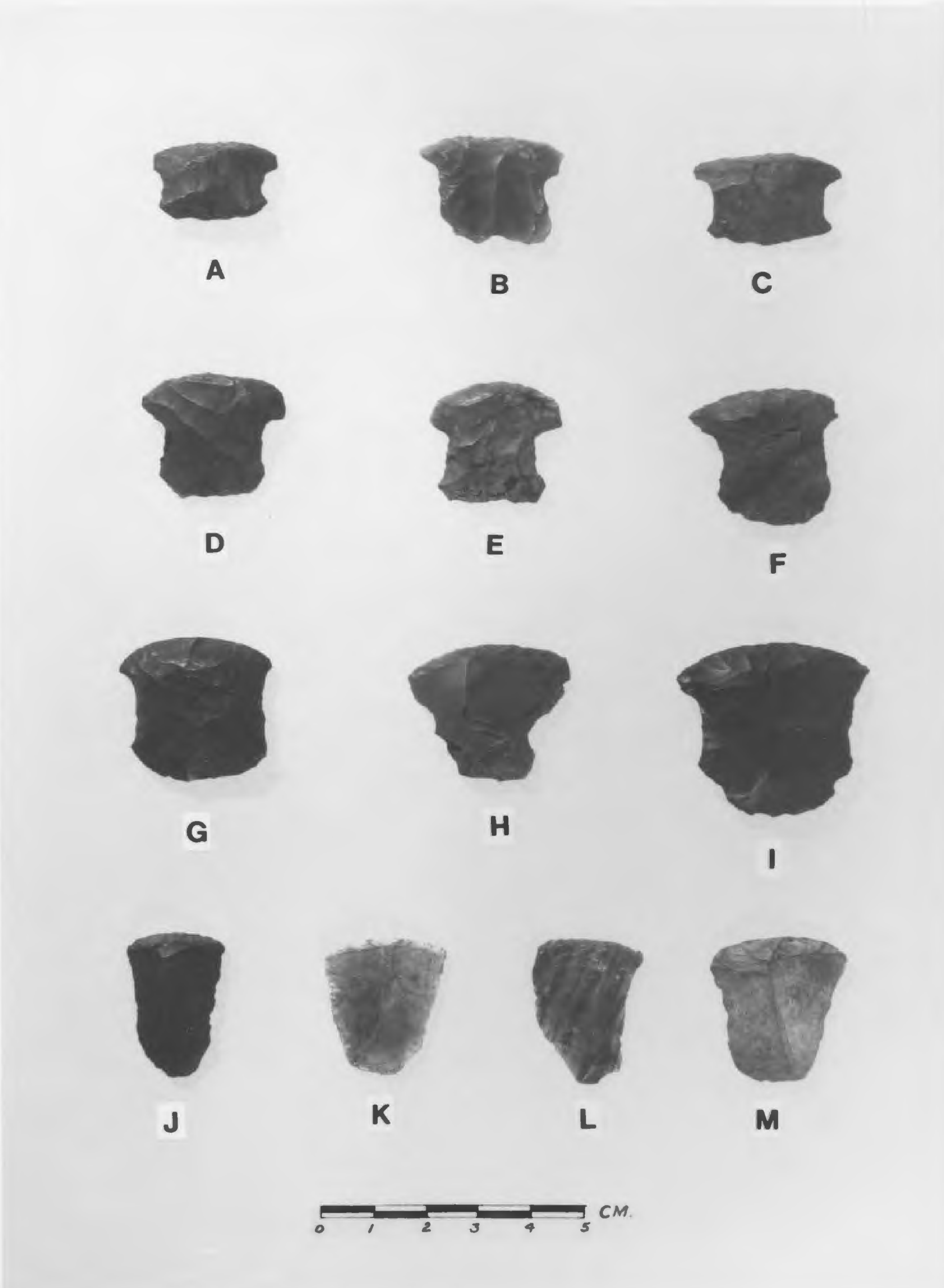

A
B
C
D
E
F
G
H
I
J
K
L
M
CM.
0 1 2 3 4 5

Plate 15: Triangular and miscellaneous endscrapers

A-J Unnotched triangular endscrapers

K,L Side-notched triangular endscrapers

M-P Miscellaneous endscrapers

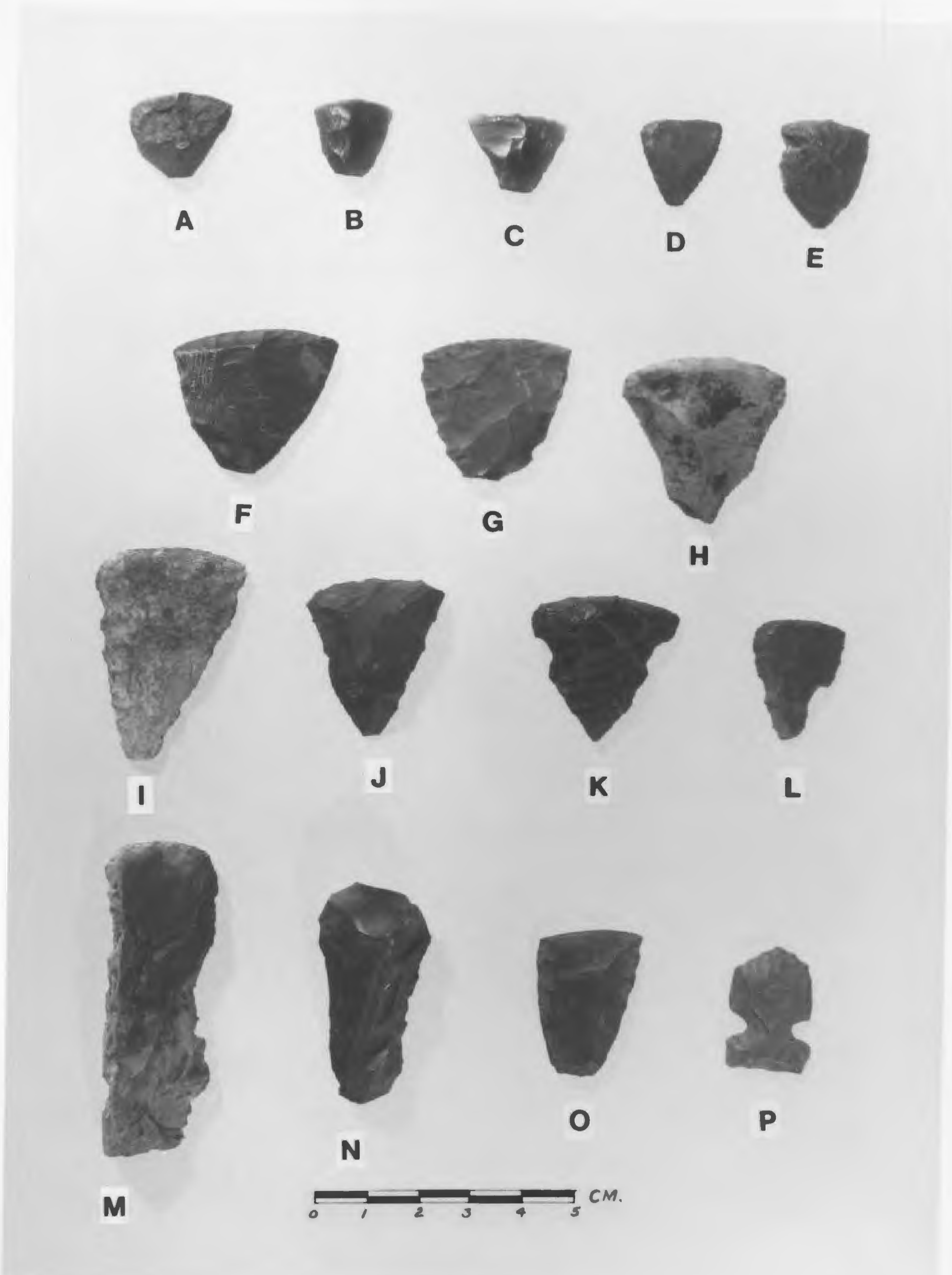

A
B
C
D
E
F
G
H
I
J
K
L
M
N
O
P
CM.
0 1 2 3 4 5

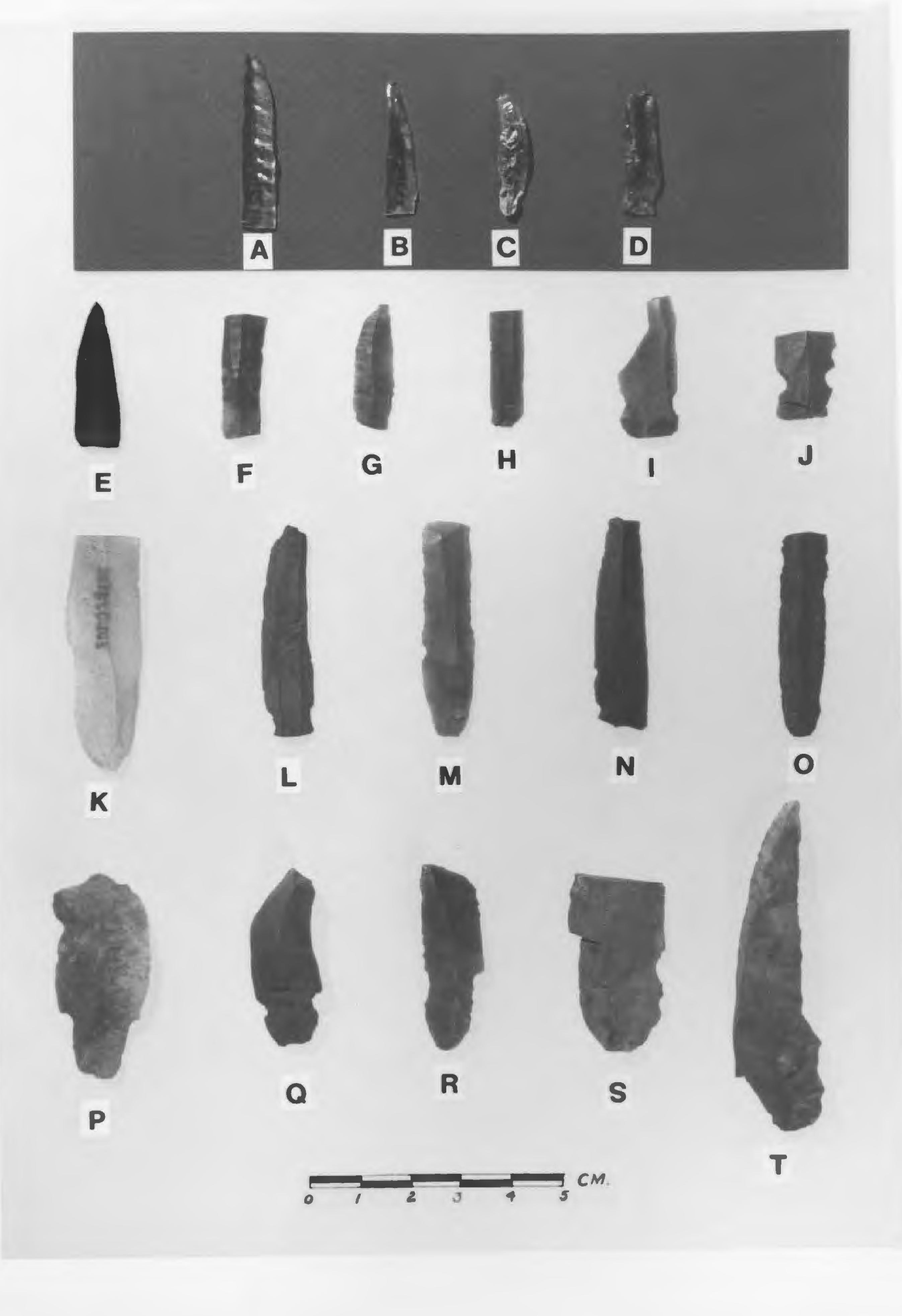
Plate 16: Microblades/blades

A-D Quartz crystal

E-T Chert

K Ramah chert

Hafting modification is visible on C, D, I, J, P, Q, R and S.


A
B
C
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G
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I
J
K
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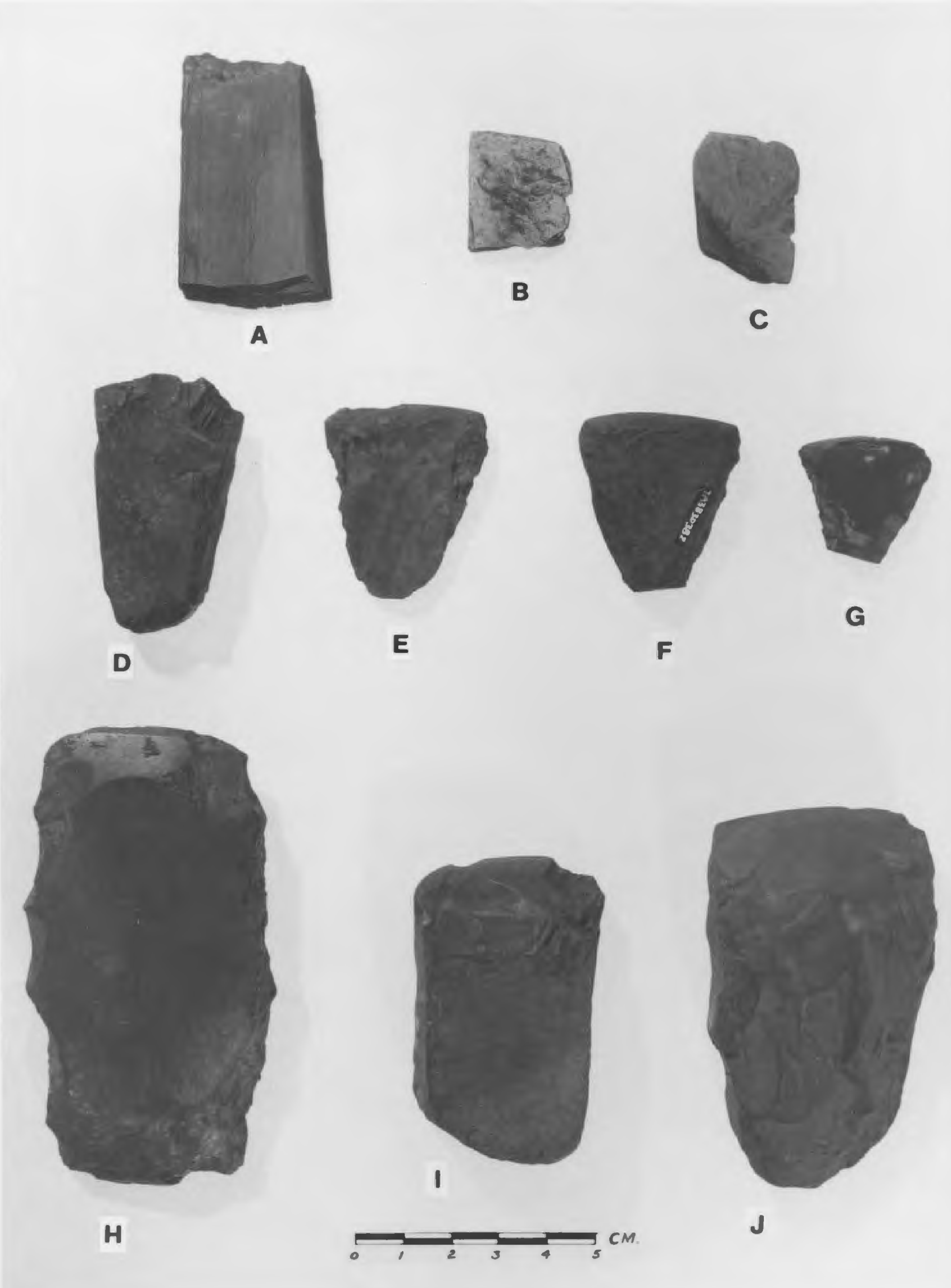
M
N
O
P
Q
R
S
T
CM.
0
1
2
3
4
5

Plate 17: Ground slate artefacts

A-C Tabular objects of unknown function

D-J Adzes


A
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C
D
E
F
G
H
I
J
CM.
0 1 2 3 4 5

Plate 18: Vessels and unidentified stone object

A,B Oval lamp rim fragments from two different vessels

C Unidentified stone obect

D Rectangular cooking vessel fragment

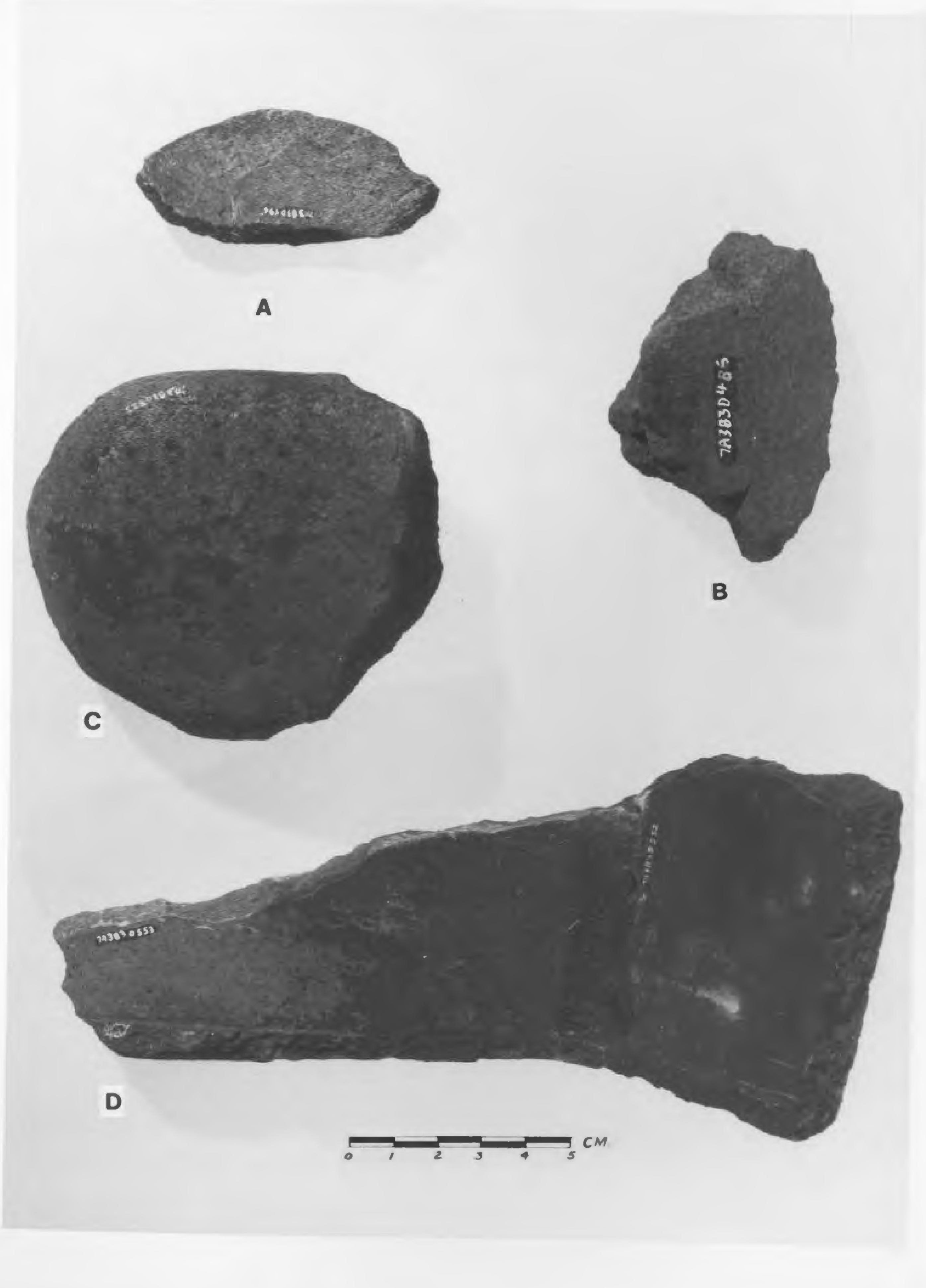

A
B
C
D
0 1 2 3 4 5 CM

Plate 19: Miscellaneous lithic artefacts

A-E Flake perforators

F Pendant?

G-I Microblade/blade cores

G Quartz crystal

H-I Cow Head chert

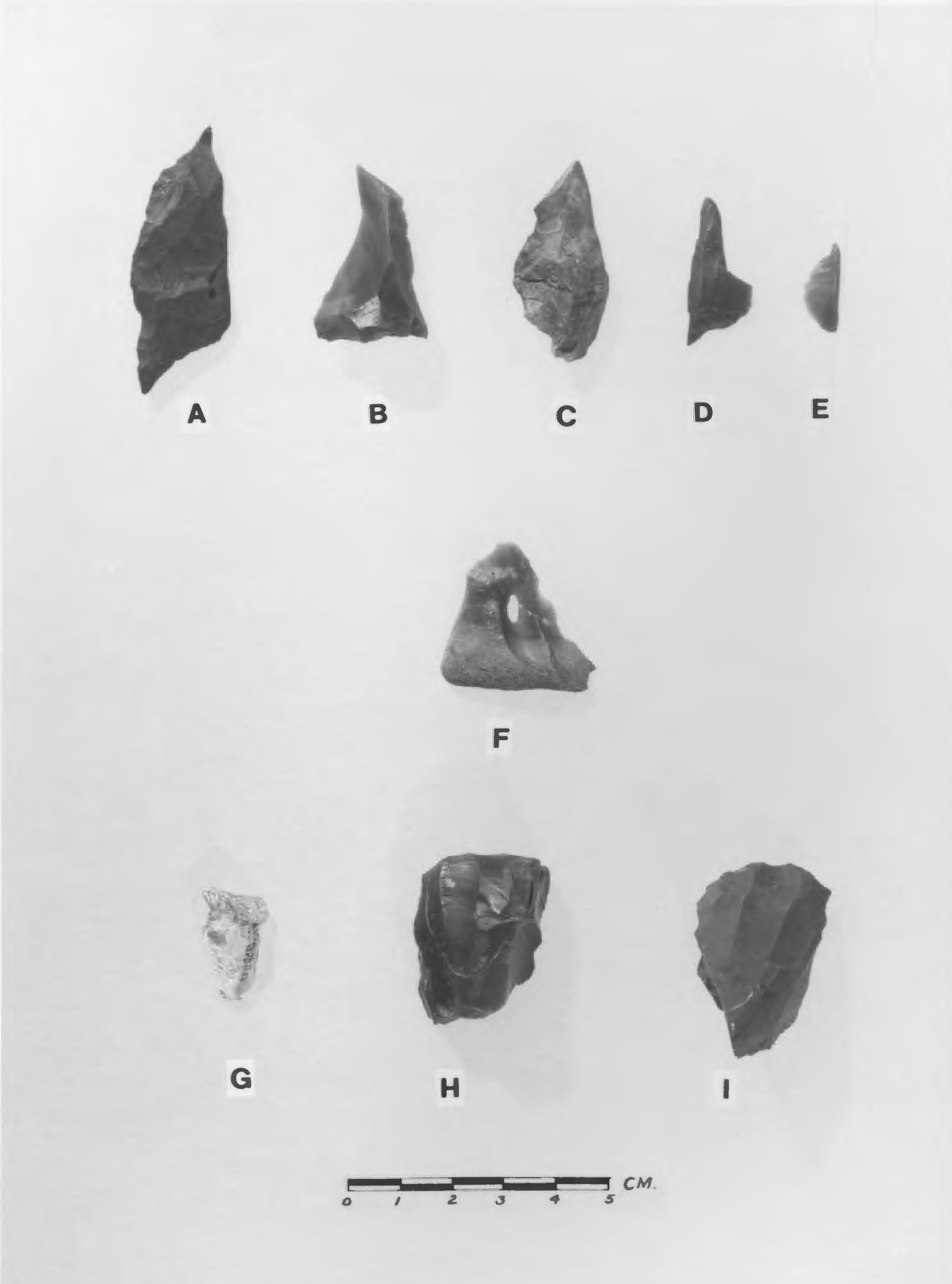

A
B
C
D
E
F
G
H
I
0 1 2 3 4 5 CM.

Plate 20: Harpoon heads - dorsal surfaces


A
B
C
D
E
F
0 1 2 3 4 5
CM.

Plate 21: Harpoon heads - ventral surfaces

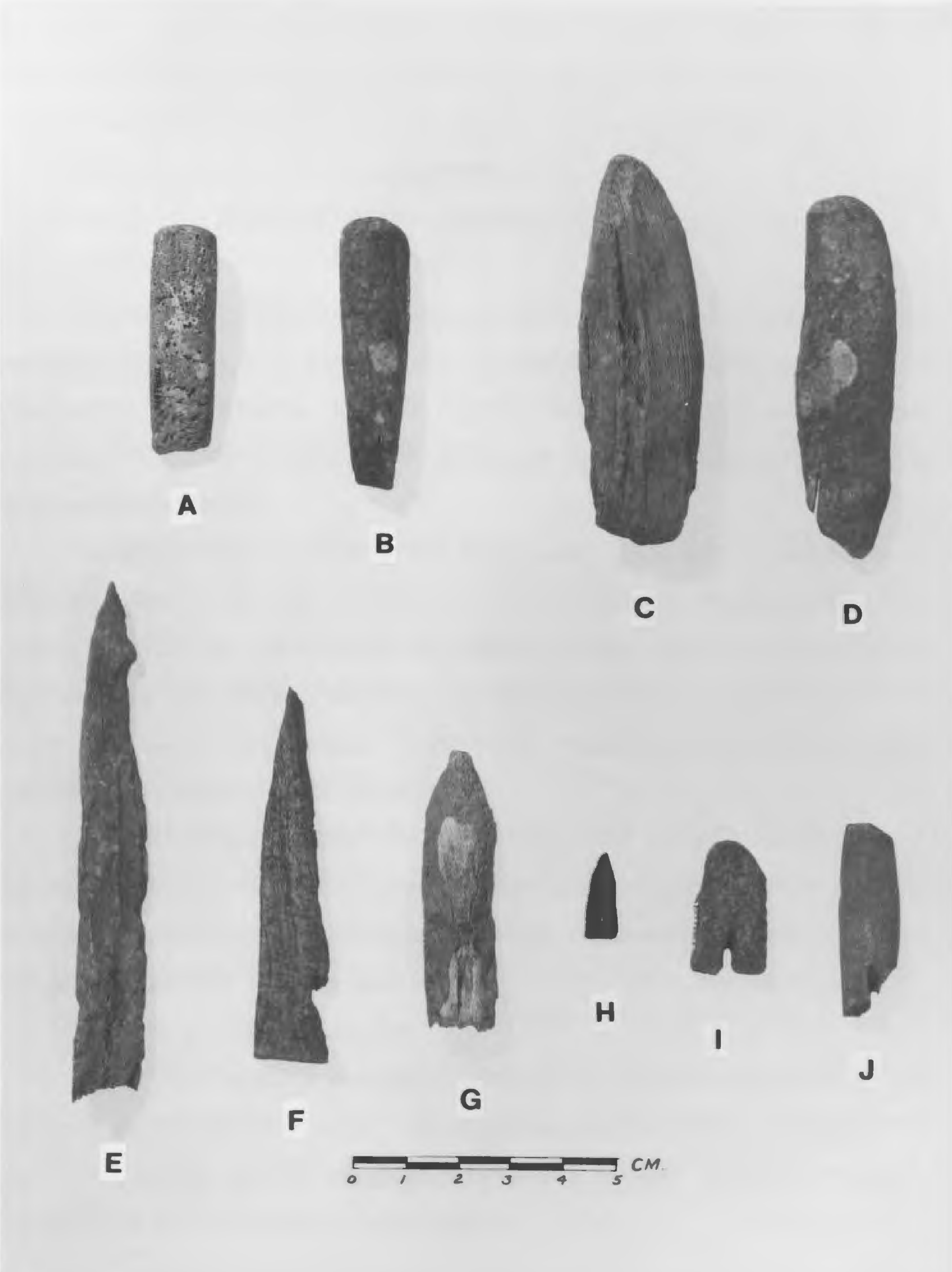

A
B
C
D
E
F
CM.
0 1 2 3 4 5

Plate 22: Flaking punches and miscellaneous organic artefacts

A-D Flaking punches

C walrus ivory

E-J Unidentifiable organic artefacts



A
B
C
D
E
F
G
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I
J
CM.
0 1 2 3 4 5

Appendix A
Description of Artefact Attributes

This appendix will outline the specific attributes used in the artefact analysis of Chapter 5 and in the following tabular descriptions for endblades, sideblades, knives, burin-like-tools, endscrapers and microblades/blades. It will begin with some general comments applicable to all artefact classes.

Artefact Orientation: Artefacts were generally positioned on their ventral surface with the proximal end closest to the observer. The ventral surface was defined as the flatter or less convex surface. The proximal end was the end showing the bulb of percussion or the basal end of the artefact. In this position, Edge A was defined as the left lateral edge while Edge B was the right lateral edge.

Measurement: Artefacts were measured in millimetres to the nearest hundredth of a millimetre. In general measurements are of the maximum value obtained for length, width, thickness etc. following the standard definitions of these terms.

Standard Abbreviations:

ARTNO (Artefact number): This is the number assigned to the artefact. It indicates the site (7A), operation (382 or 383), sub-operation (A, B, C, or D) and lot number (sequential number assigned to each artefact in a sub-operation) of the artefact.

LEV (Level): This is the stratigraphic level in which the artefact was recovered. As Level 1 was the sterile covering of peat and Level 4 was the sterile sub-soil, artefacts were not recovered from these levels.

FEA (Feature): This indicates which feature the artefact was found in. In certain cases an artefact was found in two overlapping features.

CON (Condition): The condition of the artefact.
CO - complete
I - incomplete

RM (Raw Material): The raw material from which the artefact was made.
CH - Cow Head chert
RC - Ramah chert
CHA - Chalcedony
QC - Quartz crystal

PL (Plate): Identifies the plate in which the artefact appears.

L(length): Maximum length in mm

W (width): Maximum width in mm

T (thickness): Maximum thickness in mm

-: Indicates that a particular non-metric attribute could not be observed or was not applicable.

0.00: Indicates that a particular metric attribute could not be measured or was not applicable.

Other abbreviations are specific to one or more artefact classes and will be discussed in relation to these artefact classes in the sequence in which they appear in the following tables.

Endblades:

ESAB (edge shape for edge A/edge B):
BS (base shape):
- **CX** - convex
- **CV** - concave
- **ST** - straight
- **IR** - irregular

ER (edge retouch):
- **B** - bifacial
- **PARB** - partially bifacial
- **UD** - unifacial on the dorsal surface

SRVD (surface retouch for the ventral/dorsal surfaces):
SGVD (surface grinding for the ventral/dorsal surfaces):
- **CO** - complete
- **PAR** - partial
- **PR** - present (cannot determine whether complete or not)
- **AB** - absent

TXS (transverse cross-section):
LXS (longitudinal cross-section):
- **PLCX** - plano-convex
- **BICX** - biconvex
- **CVCX** - concavo-convex
- **IR** - irregular
- **IRCX** - irregular-convex

BTVD (basal thinning on the ventral/dorsal surfaces):
- **AB** - absent
- **F** - flaked
- **G** - ground

BB (basal bevelling):
- **D** - dorsally bevelled
- **AB** - absent

TF (tip-fluting):
- **AB** - absent
- **V** - on ventral surface
- **D** - on dorsal surface

HM (hafting modification):
- **SN** - side-notched
- **AB** - absent

#N (number of notches for edge A/edge B)

NGAB (notch grinding on edge A/edge B):
- **PR** - present
- **AB** - absent

NH (notch height): the distance from the base of the endblade to the lower edge of the side notch

NW (notch width): the maximum width of the side notch

ND (notch depth): the maximum depth of the side-notch

SW (stem width): the width of the endblade between the side-notches

NHL (notch height to length ratio)

LW (length to width ratio)

Sideblades:

ESAB (edge shape for edge A/edge B):
- **CX** - convex
- **CV** - concave
- **IR** - irregular

SR (surface retouch):
- **CO** - complete
- **PAR** - partial
- **UD** - unifacial on the dorsal surface
- **AB** - absent

ER (edge retouch):
- **B** - bifacial
- **PARB** - partially bifacial

Knives:

SY (blade symmetry):
- **AS** - asymmetric
- **SY** - symmetric

ESAB (edge shape for edge A/edge B):
BS (base shape):
- **CV**- concave
- **CX** - convex
- **ST** - straight
- **IR** - irregular

BT (basal thinning):
- **AB** - absent
- **D** - present on dorsal surface
- **V** - present on ventral surface
- **B** - bifacial

SRVD (surface retouch on the ventral/dorsal surfaces):
SGVD (surface grinding on the ventral/dorsal surfaces):
- **PAR** - partial
- **CO** - complete
- **AB** - absent
- **PR** - present

TXS (transverse cross-section):
LXS (longitudinal cross-section):
- **PLCX** - planoconvex
- **BICX** - biconvex
- **CVCX** - concavo-convex
- **CXIR** - convex-irregular

HM (hafting modification - for edge A/edge B if different):
- **SN** - side-notched
- **CN** - corner-notched
- **AB** - absent

#N (number of notches on edge A/edge B)

NH (notch height)
NW (notch width)
ND (notch depth)

Burin-like-tools:

SRVD (surface retouch on the ventral/dorsal surfaces):
SGVD (surface grinding on the ventral/dorsal surfaces):
- **AB** - absent
- **PA** - partial
- **PR** - present
- **CO** - complete

DES (distal end shape):
PES (proximal end shape):
- **CX** - convex
- **CV** - concave
- **ST** - straight
- **AN** - angled
- **IR** - irregular

HM (hafting modification):
- **SN** - side-notched
- **CN** - corner notched

#N (number of notches on edge A/edge B)

EDGEA (treatment of edge A):
EDGEB (treatment of edge B):
DEND (treatment of distal end):
PEND (treatment of proximal end):
- **BB** - bifacially bevelled
- **DB** - dorsally bevelled
- **ST** - straight
- **2FA** - two facets on the bevel
- **BF** - bifacially flaked
- **BG** - bifacially ground
- **VG** - ground on ventral surface of edge
- **DG** - ground on dorsal surface of edge
- **VF** - flaked on ventral surface of edge
- **DF** - flaked on dorsal surface of edge
- **UW** - use-wear flaking along edge

SI (side on which working edge occurs):
- **RI** - right
- **LE** - left

Endscrapers:

WES (working edge shape):
- **CX** - convex
- **ST** - straight

ESY (working edge symmetry):
- **SY** - symmetric
- **AS** - asymmetric

LERAB (lateral edge retouch for edge A/edge B):
- **B** - bifacially retouched
- **V** - retouch on vental surface of edge
- **D** - retouch on dorsal surface of edge
- **PARB** - partial bifacial retouch
- **AB** - absent
- **UT** - utilized (edge appears battered but not deliberately retouched)

SRVG (surface retouch on the ventral/dorsal surfaces):
- **AB** - absent
- **PAR** - partial
- **CO** - complete
- **PR** - present but cannot determine extent

HM (hafting modification):
- **AB** - absent
- **ST** - stem
- **SN** - side-notches

BT (basal thinning):
- **V** - thinned on ventral surface
- **D** - thinned on dorsal surface
- **B** - bifacially thinned
- **AB** - absent

SNUB (snubnosed):
- **PR**- present
- **AB** - absent

GS (graving spurs):
EC (expanded corners):[11]

- **AB** - absent
- **LE** - on left lateral edge
- **RI** - on right lateral edge
- **BO** - on both lateral edges

WEC (working edge cord)

Microblades/blades:

SEG (blade segment):

- **CO** - complete
- **PRO** - proximal
- **MED** - medial
- **DIS** - distal

ERA (retouch on edge A):
ERB (retouch on edge B):

- **AB** - absent
- **RET** - retouched
- **UT** - utilized

HM (hafting modification):

- **AB** - absent
- **ST** - stem
- **SN** - side-notches

#A (number of arrises)

W1 (maximum width 1):
This is the maximum width of the microblade/blade.

W2 (maximum width 2):
This width measurement follows the convention outlined by Sanger, McGhee and Wyatt (1970) in which the width is measured just distal to the bulb of percussion.

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11 The attributes of graving spurs and expanded corners are defined following Sawicki (n.d.:166-167). They are included here simply to show the variation from edge to edge on any one endscraper. See Chapter 5.3.3.6 for a discussion of the problems associated with the use of these attributes.

Appendix B

Tabular Artefact Descriptions

Table 33a: Endblade non-metric attributes

ARTNO	LEV	FEA	CON	ESAB	BS	ER	SRVD	SGVD	TXS	LXS	BTVD	BB	TF	HM	#N	NGAB	RM	PL
Side-notched																		
7A383D0443	3	-	C0	CX/CX	ST	B	CO/CO	AB/AB	PLCX	CVCX	AB/AB	D	AB	SN	1/1	PR/PR	CH	7:O
7A383D0999	3L	2A	CO	CX/CX	ST	B	CO/CO	AB/AB	PLCX	CVCX	F/AB	D	AB	SN	1/1	AB/AB	CH	7:P
7A383D0779	3	2A	CO	CX/CX	ST	B	PAR/PAR	PAR/AB	PLCX	PLCX	F-G/AB	D	AB	SN	1/1	PR/PR	CH	7:S
7A383D0778	3	2A	CO	CX/CX	ST	B	CO/CO	AB/AB	PLCX	PLCX	AB/AB	D	AB	SN	1/1	PR/PR	CH	7:T
7A383D0722	3U	-	CO	CX/IR	ST	B	CO/CO	AB/AB	BICX	BICX	AB/AB	D	AB	SN	1/1	AB/AB	CH	-
7A383D0430	3	-	CO	CX/CX	ST	PARB	AB/AB	AB/AB	PLCX	PLCX	AB/AB	D	AB	SN	1/1	PR/PR	CH	7:A
7A383D0379	3	-																
7A382C0345	3	-	CO	CX/CX	ST	B	CO/CO	AB/AB	PLCX	CVCX	F/AB	D	AB	SN	1/1	PR/PR	CH	7:U
7A383D0985	3	2A	CO	CX/CX	ST	B	CO/PAR	AB/AB	IR	IRCX	F/AB	D	AB	SN	1/1	PR/PR	CH	-
7A383D0065	2	-	CO	CX/CX	ST	B	CO/CO	AB/AB	PLCX	CVCX	AB/AB	D	AB	SN	1/1	PR/PR	CH	7:F
7A383D0938	2	2A	CO	CX/CX	ST	B	CO/CO	AB/AB	PLCX	IRCX	AB/AB	D	AB	SN	1/1	PR/PR	CH	7:C
7A383D0296	2	2	CO	ST/ST	ST	B	CO/CO	AB/AB	PLCX	PLCX	F/AB	D	AB	SN	1/1	PR/PR	CH	7:N
7A382C0117	2	-	CO	CX/CX	ST	B	CO/PAR	AB/AB	PLCX	CVCX	AB/AB	D	AB	SN	1/1	AB/AB	CH	7:I
7A383D0103	2	-	CO	CX/CX	ST	B	CO/CO	AB/AB	PLCX	PLCX	AB/AB	D	AB	SN	1/1	PR/PR	CH	7:G
7A382C0422	3A	-	CO	CX/CX	ST	B	CO/CO	AB/AB	PLCX	CVCX	F/AB	D	AB	SN	1/1	PR/AB	CH	7:E
7A382C0036	2	-	CO	CX/CX	ST	B	CO/CO	AB/AB	PLCX	PLCX	F/AB	D	AB	SN	1/1	PR/PR	CH	7:Q
7A383C0531	3A	-	CO	CX/CX	CV	B	CO/CO	AB/AB	PLCX	CVCX	F/AB	D	AB	SN	1/1	PR/PR	CH	7:H
7A383D0883	3A	2A	CO	CX/CX	ST	B	CO/CO	AB/AB	PLCX	CVCX	F/AB	D	AB	SN	1/1	PR/PR	CH	7:M
7A383D0667	3A	-	CO	CX/CX	CV	PARB	AB/PAR	AB/AB	PLCX	CVCX	F/AB	D	AB	SN	1/1	PR/PR	CH	7:V
7A382C0492	3A	-	CO	CX/CX	ST	B	CO/CO	AB/AB	PLCX	PLCX	F/AB	D	AB	SN	1/1	PR/PR	CH	-
7A383D0820	3A	2A	CO	CX/CX	ST	B	CO/CO	AB/AB	PLCX	PLCX	F/AB	D	AB	SN	1/1	AB/AB	CH	7:B
7A382C0022	2	-	CO	CX/CX	CV	PARB	PAR/CO	AB/AB	PLCX	PLCX	F/AB	D	AB	SN	1/1	PR/PR	CH	7:D
7A383D0766	3A	-	I	CX/CX	ST	B	PR/PR	AB/AB	PLCX	PLCX	F/AB	D	AB	SN	1/1	PR/AB	CH	-
7A382C0454	3A	-	I	CX/CX	ST	B	PAR/PR	AB/AB	PLCX	IRCX	AB/AB	D	AB	SN	1/1	PR/PR	CH	-
7A382C0134	2	-	I	ST/ST	ST	PARB	AB/PAR	AB/AB	PLCX	-	F/AB	D	AB	SN	1/1	PR/PR	CH	7:J
7A383D0889	3A	2A	I	ST/ST	ST	B	PAR/PR	PAR/AB	PLCX	PLCX	G/AB	D	AB	SN	1/1	PR/PR	CH	-
7A383A0104	2	-	I	-/CX	ST	B	PR/PR	AB/AB	PLCX	CVCX	F/AB	D	AB	SN	1/1	PR/PR	CH	-
7A383A0113	2	-	I	ST/CX	ST	B	PR/PAR	AB/AB	PLCX	PLCX	F/AB	D	AB	SN	1/1	AB/AB	CH	7:R
7A382C0013	2	-	I	-/-	ST	B	PR/PR	AB/AB	PLCX	-	AB/AB	D	-	SN	1/1	PR/PR	CH	-

Table 33a: Endblade non-metric attributes continued

ARTNO	LEV	FEA	CON	ESAB	BS	ER	SRVD	SGVD	TXS	LXS	BTVD	BB	TF	HM	#N	NGAB	RM	PL
7A382C0288	3	-	I	-/CX	ST	B	PAR/PAR	AB/AB	IR	-	AB/AB	D	AB	SN	1/1	-/PR	CH	-
7A383D0330	2	-	I	ST/ST	ST	B	PR/PAR	AB/AB	PLCX	-	F/AB	D	AB	SN	1/1	PR/PR	CH	-
7A383D0782	3A	2A	I	CX/CX	-	B	PR/PR	AB/AB	PLCX	-	-/-	-	AB	SN	-/-	-/-	CH	-
7A382C0426	3A	-	I	CX/CX	-	B	PR/PR	AB/AB	PLCX	-	-/-	-	AB	SN	-/-	-/-	CH	-
7A383D0561	3A	-	I	CX/ST	-	B	PAR/PR	AB/AB	PLCX	-	-/-	-	AB	SN	-/-	-/-	CH	-
7A383D0509	3	2A	I	ST/ST	-	PARB	AB/PR	AB/AB	PLCX	-	-/-	-	AB	SN	-/-	-/-	CH	7:L
7A383D0827	3A	-	I	CX/CX	-	UD	AB/PAR	AB/AB	PLCX	-	-/-	-	AB	SN	-/-	-/-	CH	-
7A383D0274	2	-	I	IR/CX	-	PARB	PAR/PR	AB/AB	PLCX	-	-/-	-	AB	SN	-/1	-/PR	CH	-
7A383C0060	2	-	I	CX/CX	-	B	PR/PR	AB/AB	PLCX	-	-/-	-	AB	SN	-/-	-/-	CH	-
7A382B0049	2	-	I	ST/ST	-	PARB	AB/PR	AB/AB	PLCX	-	-/-	-	AB	SN	-/-	-/-	CH	-
7A383DO747	3A	2A	I	CX/CX	-	UD	AB/PAR	AB/AB	PLCX	-	-/-	-	AB	SN	-/-	AB/AB	CH	-
7A382C0408	3	-	I	CX/CX	-	B	PR/PR	AB/AB	BICX	-	-/-	-	AB	SN	-/-	-/-	CH	-
7A382C0094	2	-	I	CX/CX	-	B	PR/PR	AB/AB	PLCX	-	-/-	-	AB	SN	-/-	-/-	CH	-
7A383D0014	2	-	I	CX/CX	-	B	PR/PR	AB/AB	PLCX	-	-/-	-	AB	SN	-/-	-/-	CH	-
7A383D0917	3	2	I	ST/ST	-	B	PAR/PR	PAR/AB	BICX	-	-/-	-	AB	SN	-	-/-	CH	-
7A383D0989	3U	2A	I	ST/ST	-	B	PAR/PR	PAR/AB	PLCX	-	-/-	-	AB	SN	-/-	-/-	CH	-
7A383D1062	3A	2A	I	CX/CX	-	B	PR/PR	AB/AB	PLCX	-	-/-	-	AB	SN	-/-	-/-	CH	-
7A382C0182	2	-	I	ST/CX	ST	B	PR/PR	AB/AB	PLCX	-	F/AB	D	-	SN	1/1	PR/PR	CH	-
7A382C0014	2	-	I	-/-	ST	B	PR/PR	AB/AB	PLCX	-	AB/AB	D	-	SN	1/1	PR/PR	CH	-
7A382C0309	3	-	I	-/-	ST	B	PR/PR	AB/AB	BICX	-	F/AB	D	-	SN	1/1	PR/PR	CH	K
7A382C0392	3A	-	I	-/-	ST	B	PR/PR	AB/AB	PLCX	-	AB/AB	D	-	SN	1/1	PR/PR	CH	-
7A383D1248	2	-	I	-/-	ST	B	PR/PR	AB/AB	PLCX	-	F/AB	D	-	SN	1/1	PR/PR	CH	-
7A383D1106	2	-	I	-/-	ST	B	PR/PR	AB/AB	PLCX	-	F/AB	D	-	SN	1/1	PR/PR	CH	-
7A383D1031	3	-	I	-/-	ST	B	PR/PR	AB/AB	PLCX	-	AB/AB	D	-	SN	1/1	PR/PR	CH	-
7A383D1041	3	2A	I	-/-	ST	B	PR/PR	AB/AB	PLCX	-	F/AB	D	-	SN	1/1	PR/PR	CH	-
7A383A0001	2	-	I	-/-	ST	B	PR/PR	AB/AB	BICX	-	F/F	AB	-	SN	-/1	-/PR	CH	-
7A382C0003	2	-	I	-/-	ST	B	PR/PAR	AB/AB	PLCX	-	F/AB	D	-	SN	1/1	AB/AB	CH	-
7A383D0528	3A	-	I	-/-	ST	B	PR/PR	AB/AB	PLCX	-	F/AB	D	-	SN	1/1	PR/PR	CH	-
7A383D0008	2	-	I	-/-	ST	B	PR/PR	AB/AB	PLCX	-	F/AB	D	-	SN	1/1	PR/PR	CH	-
7A383D0672	3A	-	I	-/-	ST	B	PR/PR	AB/AB	PLCX	-	F/AB	D	-	SN	1/1	PR/PR	CH	-

Table 33a: Endblade non-metric attributes continued

ARTNO	LEV	FEA	CON	ESAB	BS	ER	SRVD	SGVD	TXS	LXS	BTVD	BB	TF	HM	#N	NGAB	R M	PL
7A383D0962	2	2?	I	-/-	ST	B	PR/PR	AB/AB	PLCX	-	F/AB	D	-	SN	1/1	PR/PR	CH	-
7A383D0714	3A	-	I	-/-	ST	UD	PAR/PR	AB/AB	PLCX	-	F/AB	D	-	SN	1/1	PR/PR	CH	-
7A383D0022	2	-	I	-/-	ST	B	PR/PR	AB/AB	PLCX	-	F/AB	D	-	SN	1/1	AB/AB	CH	-
7A383D0861	3A	-	I	-/-	ST	B	PR/PR	AB/AB	PLCX	-	F/AB	D	-	SN	1/1	PR/PR	CH	-
7A383D0732	3A	-	I	-/-	ST	B	PR/PR	AB/AB	PLCX	-	F/AB	D	-	SN	1/1	PR/PR	CH	-
7A383D0659	3A	-	I	-/-	ST	B	PAR/PAR	PAR/PAR	PLCX	-	F-G/AB	D	-	SN	1/1	PR/PR	CH	-
7A383D0955	2	2	I	-/-	IR	B	PR/PR	AB/AB	PLCX	-	AB/AB	D	-	SN	1/1	AB/AB	CH	-
7A383D1438	3U	-	I	-/-	ST	UD	PR/PR	AB/AB	PLCX	-	AB/AB	D	-	SN	-/-	-/-	CH	-
7A383D1431	3A	-	I	-/-	ST	UD	AB/AB	AB/AB	PLCX	-	AB/AB	D	-	SN	-/-	-/-	CH	-
7A382C0369	3	-	I	-/-	ST	-	PR/PR	AB/AB	PLCX	-	F/AB	D	-	SN	-/-	PR/-	CH	-
7A383C0023	3	2A	I	-/-	ST	-	PR/PR	AB/AB	PLCX	-	F/AB	D	-	SN	-/-	PR/PR	CH	-
7A383D0688	3A	-	I	-/-	ST	PARB	PAR/PR	AB/AB	PLCX	-	AB/AB	D	-	SN	-/-	AB/AB	CH	-
7A382C0512	3	-	I	-/-	ST	-	PR/PR	AB/AB	PLCX	-	AB/AB	D	-	SN	-/-	AB/AB	CH	-
7A382C0437	3A	-	I	-/-	ST	-	PR/PR	AB/AB	PLCX	-	AB/AB	D	-	SN	-/-	-/-	CH	-
7A382C0458	3A	-	I	-/-	ST	B	PR/PR	AB/AB	PLCX	-	F/AB	D	-	SN	-/-	PR/PR	CH	-
7A383C0028	3A	-	I	-/-	ST	-	PAR/PR	AB/AB	PLCX	-	F/AB	D	-	SN	-/-	PR/PR	CH	-
7A383D0078	2	-	I	-/-	ST	-	-/-	-/-	PLCX	-	F/F	AB	-	SN	-/-	PR/PR	CH	-
7A383D0944	2	2A	I	-/-	ST	-	PR/PR	AB/AB	PLCX	-	F/AB	D	-	SN	-/-	-/-	CH	-
7A383A0049	2	-	I	-/-	ST	-	AB/PR	PR/AB	PLCX	-	G/AB	D	-	SN	-/-	-/-	CH	-
7A383D1108	2	-	I	-/-	ST	-	PR/PR	AB/AB	PLCX	-	F/AB	D	-	SN	-/-	PR/PR	CH	-
7A382C0135	2	-	I	-/-	ST	B	PR/PR	AB/AB	PLCX	-	F/AB	D	-	SN	-/-	PR/PR	CH	-
7A382C0075	2	-	I	-/-	ST	B	PR/PR	AB/AB	PLCX	-	F/AB	D	-	SN	-/-	-/-	CH	-
7A383D0368	2	2	I	-/-	ST	B	PR/AB	AB/AB	IRIR	-	F/AB	D	-	SN	-/-	-/PR	CH	-
7A383D0105	2	-	I	-/-	ST	-	PR/PR	AB/AB	PLCX	-	F/AB	D	-	SN	-/-	PR/PR	CH	-
Triangular, concave-based																		
7A383D0151	2	2A	CO	ST/CX	CV	PARB	PAR/PAR	AB/AB	BICX	BICX	F/F	AB	AB	AB	-	-	CH	8:H
7A383D0308	2	2A	C0	CX/IR	CV	UD	AB/AB	AB/AB	PLCX	IRCX	F/F	AB	AB	AB	-	-	CH	8:I
7A382C0169	2	-	I	ST/CX	CV	PARB	PAR/PR	AB/AB	PLCX	-	-/-	-	V	AB	-	-	CH	8:J
7A383D1005	3	2A	I	CX/-	CV	PARB	PR/PR	AB/AB	PLCX	-	-/-	-	V	AB	-	-	CH	8:L
7A383D0192	2	-	I	-/-	CV	B	PR/PR	AB/AB	BICX	-	F/F	AB	-	AB	-	-	CH	8:K

Table 33a: Endblade non-metric attributes continued

ARTNO	LEV	FEA	CON	ESAB	BS	ER	SRVD	SGVD	TXS	LXS	BTVD	BB	TF	HM	#N	NGAB	RM	PL
7A383D0252	2	-	I	ST/ST	CV	PARB	PAR/PAR	AB/AB	PLCX	-	F/F	AB	-	AB	-	-	CH	-
7A383C0064	2	-	I	- / -	CV	B	PR/PR	AB/AB	PLCX	-	F/F	AB	-	AB	-	-	CH	-
7A383D0842	3A	2A	I	CX/-	CV	B	PR/PR	AB/AB	BICX	-	- / -	-	-	AB	-	-	CH	-
7A382B0001	2	-	I	CX/CX	-	B	PR/PR	AB/AB	PLCX	-	- / -	-	AB	AB	-	-	CH	-
7A383D0170	2	-	I	CX/CX	CV	B	PAR/PAR	AB/AB	BICX	-	F/F	AB	AB	AB	-	-	CH	-
Triangular, straight-based																		
7A383D0990	3A	2A	CO	CX/CX	ST	B	CO/CO	AB/AB	PLCX	CVCX	F/AB	D	AB	AB	-	-	CH	8:F
7A383D1265	3A	2A																
7A383D0649	3	-	CO	ST/ST	ST	B	CO/CO	AB/AB	PLCX	IRCX	F/AB	AB	AB	AB	-	-	CH	8:C
7A383D0306	2	2,7	CO	CX/CX	ST	B	PAR/PAR	AB/AB	PLCX	PLCX	AB/AB	D	AB	AB	-	-	CH	8:B
7A383D0025	2	-	CO	CX/CX	ST	PARB	CO/PAR	AB/AB	IRIR	IRIR	F/AB	D	AB	AB	-	-	CH	8:E
7A383D0028	2	-																
7A383D1045	3	2	CO	CX/CX	ST	B	CO/CO	AB/AB	BICX	BICX	AB/AB	AB	AB	AB	-	-	CH	8:A
7A383D1009	3	2																
7A383D0671	3A	2	I	CX/CX	-	B	PR/PR	AB/AB	PLCX	PLCX	- / -	-	AB	AB	-	-	CH	8:D
7A383D0587	3U	-	I	IR/IR	ST	B	PR/PAR	AB/AB	PLCX	IRIR	F/AB	D	D	AB	-	-	CH	8:G
7A383D1204	2	2	I	ST/ST	ST	B	PAR/PR	AB/AB	PLCX	-	F/AB	D	-	AB	-	-	CH	-
7A383D0411	3	-	I	ST/ST	ST	B	AB/PR	AB/AB	BICX	-	F/F	AB	-	AB	-	-	CH	-
7A382C0411	3	-	I	ST/CX	ST	B	PR/PR	AB/AB	BICX	-	F/AB	D	-	AB	-	-	CH	-
7A382C0207	2	-	I	ST/ST	ST	B	PR/PR	AB/AB	BICX	-	F/AB	D	-	AB	-	-	CH	-
7A383D0313	2	2A	I	- / -	ST	B	PR/PR	AB/AB	PLCX	-	F/AB	D	-	AB	-	-	CH	-
7A383D0502	3	2	I	- / -	ST	B	PAR/PAR	AB/AB	PLCX	-	AB/AB	AB	-	AB	-	-	CH	-
7A382B0069	3	-	I	ST/-	ST	B	PR/PR	AB/AB	PLCX	-	F/AB	D	-	AB	-	-	CH	-
7A382C0453	3A	-	I	- / -	ST	B	PR/PR	AB/AB	PLCX	-	F/AB	AB	-	AB	-	-	CH	-
7A382C0244	2	-	I	- / -	ST	B	PR/PR	AB/AB	BICX	-	AB/AB	AB	-	AB	-	-	CH	-
Miscellaneous																		
7A382C0247	2	-	CO	CX/CX	CV	B	PAR/CO	PAR/AB	PLCX	PLCX	AB/AB	D	AB	AB	-	-	CH	9:A
7A382C0241	2	-	CO	CX/CX	CX	PARB	PAR/PAR	AB/AB	PLCX	CVCX	AB/AB	AB	AB	AB	-	-	CH	9:E
7A383D0686	3A	-	CO	CX/CX	CX	B	CO/CO	AB/AB	PLCX	PLCX	AB/AB	D	AB	AB	-	-	CH	9:D
7A383D0697	3A	-																

Table 33a: Endblade non-metric attributes continued

ARTNO	LEV	FEA	CON	ESAB	BS	ER	SRVD	SGVD	TXS	LXS	BTVD	BB	TF	HM	#N	NGAB	RM	PL
7A383D0565	3A	-	I	- / -	CX	B	PAR/PAR	AB/AB	BICX	-	AB/AB	AB	-	AB	-	-	CH	9:C
7A383D0432	3	-	CO	IR/IR	ST	PARB	PAR/CO	AB/AB	IRIR	CVCX	F/AB	D	AB	SN	1 / 0	AB/-	CH	9:F
7A383D0010	2	-	I	IR/CX	ST	PARB	PAR/PR	AB/AB	PLCX	-	AB/AB	D	-	AB	-	-	CH	9:H
7A383D0593	3U	-	I	- / -	ST	PARB	PAR/PR	AB/AB	PLCX	-	AB/F	AB	-	AB	-	-	CH	9:G
7A383D0084	2	2A	CO	CX/CX	CX	PARB	PAR/CO	AB/AB	PLCX	CVCX	AB/F	D	V?	AB	-	-	CH	9:I
7A382C0553	3	-	I	CX/CX	IR	UD	AB/AB	AB/AB	PLCX	IRIR	AB/AB	AB	AB	AB	-	-	CH	9:B
Fragmentary																		
7A383C0026	3	2A	I	- / -	-	B	PR/PR	AB/AB	BICX	-	- / -	-	AB	-	-	-	CH	-
7A383D0056	2	-	I	CX/CX	-	B	PR/PR	AB/AB	BICX	-	- / -	-	AB	-	-	-	CH	-
7A383D0792	3A	-	I	CX/CX	-	B	PR/PR	AB/AB	BICX	-	- / -	-	AB	-	-	-	CH	-
7A383D0568	3A	-	I	CX/ST	-	B	PAR/PAR	AB/AB	BICX	-	- / -	-	AB	-	-	-	CH	-
7A383D1205	2	2	I	CX/CX	-	B	PR/PR	AB/AB	BICX	-	- / -	-	AB	-	-	-	CH	-
7A383D1285	2	2A	I	ST/CX	-	PARB	AB/AB	AB/AB	BICX	-	- / -	-	AB	-	-	-	CH	-
7A383D0193	2	-	I	CX/CX	-	B	PAR/PAR	AB/AB	BICX	-	- / -	-	V?	-	-	-	CH	-
7A383D0592	3A	-	I	ST/ST	-	PARB	AB/PR	AB/AB	PLCX	-	- / -	-	AB	-	-	-	CH	-
7A383D0702	3A	-	I	- / -	-	B	PR/PR	AB/AB	PLCX	-	- / -	-	AB	-	-	-	RC	-
7A382C0314	3	-	I	- / -	-	B	PR/PR	AB/AB	BICX	-	- / -	-	AB	-	-	-	CH	-
7A383D0381	3	-	I	- / -	-	B	PR/PR	AB/AB	PLCX	-	- / -	-	AB	-	-	-	CH	-
7A383D0562	2	-	I	- / -	-	B	PR/PR	AB/AB	PLCX	-	- / -	-	AB	-	-	-	CH	-
7A383D0229	2	-	I	ST/ST	-	PARB	PR/PR	AB/AB	BICX	-	- / -	-	AB	-	-	-	CH	-
7A382C0175	2	-	I	- / -	-	B	PR/PR	AB/AB	BICX	-	- / -	-	AB	-	-	-	CH	-
7A383D1023	3U	2A	I	ST/CX	-	B	PR/PR	AB/AB	PLCX	-	- / -	-	AB	-	-	-	CH	-
7A383D0369	3	-	I	ST/CX	-	B	PR/PR	AB/AB	PLCX	-	- / -	-	AB	-	-	-	CH	-
7A383D0127	2	-	I	CX/CX	-	B	PAR/PAR	AB/AB	PLCX	-	- / -	-	AB	-	-	-	RC	-
7A382C0327	3	-	I	- / -	-	B	PAR/PR	PAR/AB	BICX	-	- / -	-	AB	-	-	-	CH	-
7A383C0024	3	2A	I	- / -	-	B	PR/PR	AB/AB	BICX	-	- / -	-	AB	-	-	-	CH	-
7A382B0001	2	-	I	CX/CX	-	B	PR/PR	AB/AB	PLCX	-	- / -	-	AB	-	-	-	CH	-
7A383D0584	3A	-	I	IR/CX	-	B	PR/PR	AB/AB	BICX	-	- / -	-	AB	-	-	-	CH	-
7A382C0331	3A	-	I	- / -	-	UD	AB/PAR	AB/AB	PLCX	-	- / -	-	AB	-	-	-	CH	-
7A383D0822	3A	-	I	CR/IR	-	B	PR/PR	AB/AB	BICX	-	- / -	-	AB	-	-	-	CH	-

Table 33a: Endblade non-metric attributes continued

ARTNO	LEV	FEA	CON	ESAB	BS	ER	SRVD	SGVD	TXS	LXS	BTVD	BB	TF	HM	#N	NGAB	RM	PL
7A383C0018	3	2A	I	-/-	-	B	PR/PR	AB/AB	BICX	-	-/-	-	AB	-	-	-	CH	-
7A382C0231	2	-	I	IR/IR	-	PARB	AB/PR	AB/AB	PLCX	-	-/-	-	AB	-	-	-	CH	-
7A383D0972	3	2A	I	IR/IR	-	B	PR/PR	AB/AB	IRIR	-	-/-	-	AB	-	-	-	CH	-
7A383C0035	2	-	I	-/-	-	B	PR/PR	AB/AB	BICX	-	-/-	-	-	-	-	-	CH	-
7A382C0098	2	-	I	-/-	-	B	PR/PR	AB/AB	BICX	-	-/-	-	-	-	-	-	CH	-
7A383D0281	2	-	I	-/-	-	B	PR/PR	AB/AB	PLCX	-	-/-	-	-	-	-	-	CH	-
7A383D0102	2	-	I	-/-	-	B	PR/PR	AB/AB	PLCX	-	-/-	-	-	-	-	-	CH	-
7A382C0395	3A	-	I	-/-	-	B	PR/PR	AB/AB	PLCX	-	-/-	-	-	-	-	-	CH	-
7A383D0634	3	-	I	-/-	-	B	PR/PR	AB/AB	BICX	-	-/-	-	-	-	-	-	CH	-

Table 33b: Endblade metric attributes

ARTNO	NH	NW	ND	SW	NHL	L	W	T	LW
Side-notched									
7A383D0443	7.38	5.78	3.40	8.88	0.22	33.70	15.12	4.66	2.23
7A383D0999	9.42	7.14	3.88	10.54	0.24	39.50	19.98	5.24	1.98
7A383D0779	9.36	3.84	4.08	9.80	0.18	53.40	16.78	3.72	3.18
7A383D0778	6.80	4.16	3.24	9.44	0.16	42.52	15.62	4.16	2.72
7A383D0722	3.18	3.78	2.44	7.40	0.12	27.52	13.54	3.98	2.03
7A383D0430	5.58	3.66	2.36	4.40	0.27	21.72	9.12	2.50	2.38
7A383D0379									
7A382C0345	7.80	4.16	3.86	7.50	0.19	40.30	15.28	5.14	2.64
7A383D0985	6.78	3.58	2.40	9.82	0.27	25.04	15.18	3.48	1.65
7A383D0065	2.36	2.90	1.94	6.92	0.08	28.32	11.68	3.38	2.42
7A383D0938	7.08	4.86	2.18	7.18	0.24	29.12	12.34	4.18	2.36
7A383D0296	4.54	5.20	3.12	8.34	0.12	37.94	15.66	4.28	2.42
7A382C0117	3.22	4.04	2.58	9.18	0.10	33.60	14.84	3.24	2.26
7A383D0103	7.94	5.00	1.58	7.28	0.24	33.02	11.34	2.96	2.91
7A382C0422	4.18	3.18	1.66	9.34	0.17	25.04	13.24	4.08	1.89
7A382C0036	6.94	6.70	4.32	10.66	0.21	33.16	18.86	3.80	1.76
7A383C0531	6.18	7.10	2.52	9.84	0.20	31.50	16.36	4.10	1.93
7A383D0883	5.40	2.94	2.54	10.06	0.16	33.58	14.88	4.34	2.26
7A383D0667	10.70	5.16	3.18	9.88	0.29	36.78	16.54	4.02	2.22
7A382C0492	8.16	4.12	3.36	9.58	0.23	36.08	15.74	4.48	2.29
7A383D0820	8.44	5.44	3.08	9.10	0.30	28.48	16.22	4.38	1.76
7A382C0022	5.88	5.30	2.76	7.26	0.24	24.68	13.36	3.68	1.85
7A383D0766	4.78	4.10	3.00	9.48	0.00	0.00	15.44	3.90	0.00
7A382C0454	3.82	0.00	2.08	10.56	0.00	0.00	0.00	5.14	0.00
7A382C0134	4.84	4.22	2.36	6.06	0.00	0.00	0.00	2.60	0.00
7A383D0889	6.94	3.78	2.62	8.30	0.00	0.00	15.00	3.80	0.00
7A383A0104	8.60	4.80	3.28	8.54	0.00	0.00	15.00	3.39	0.00
7A383A0113	7.72	7.20	3.78	9.72	0.00	0.00	19.50	10.06	0.00
7A382C0013	5.62	4.74	2.52	11.00	0.00	0.00	17.22	4.34	0.00

Table 33b: Endblade metric attributes continued

ARTNO	NH	NW	ND	SW	NHL	L	W	T	LW
7A382C0288	8.54	4.64	3.84	0.00	0.00	0.00	0.00	4.52	0.00
7A383D0330	5.80	3.60	1.98	7.22	0.00	0.00	10.70	3.14	0.00
7A383D0782	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
7A382C0426	0.00	0.00	0.00	0.00	0.00	0.00	14.32	4.46	0.00
7A383D0561	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
7A383D0509	0.00	0.00	0.00	0.00	0.00	0.00	9.02	2.84	0.00
7A383D0827	0.00	0.00	0.00	0.00	0.00	0.00	9.16	2.66	0.00
7A383D0274	0.00	0.00	0.00	0.00	0.00	0.00	0.00	4.32	0.00
7A383C0060	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
7A382B0049	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.26	0.00
7A383DO747	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
7A382C0408	0.00	0.00	0.00	0.00	0.00	0.00	17.80	4.98	0.00
7A382C0094	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
7A383D0014	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
7A383D0917	0.00	0.00	0.00	0.00	0.00	0.00	18.54	3.76	0.00
7A383D0989	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
7A383D1062	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
7A382C0182	8.14	6.02	3.32	9.62	0.00	0.00	17.50	4.14	0.00
7A382C0014	6.76	5.12	3.74	8.82	0.00	0.00	0.00	3.64	0.00
7A382C0309	3.48	2.64	1.74	6.32	0.00	0.00	11.12	2.88	0.00
7A382C0392	6.22	5.52	5.08	9.42	0.00	0.00	18.00	4.52	0.00
7A383D1248	7.34	8.26	4.98	10.56	0.00	0.00	20.64	4.90	0.00
7A383D1106	7.62	7.00	4.32	10.16	0.00	0.00	19.44	4.60	0.00
7A383D1031	8.70	4.86	4.04	10.32	0.00	0.00	17.66	4.00	0.00
7A383D1041	4.92	4.72	3.86	8.80	0.00	0.00	0.00	0.00	0.00
7A383A0001	2.86	3.94	1.68	11.62	0.00	0.00	0.00	0.00	0.00
7A382C0003	6.72	4.70	2.92	10.46	0.00	0.00	19.04	3.68	0.00
7A383D0528	6.08	6.38	3.92	10.40	0.00	0.00	0.00	0.00	0.00
7A383D0008	4.64	4.56	2.12	10.62	0.00	0.00	0.00	4.98	0.00
7A383D0672	8.18	5.00	3.56	9.62	0.00	0.00	17.84	4.72	0.00

Table 33b: Endblade metric attributes continued

ARTNO	NH	NW	ND	SW	NHL	L	W	T	LW
7A383D0962	8.30	3.90	2.90	11.58	0.00	0.00	20.14	4.10	0.00
7A383D0714	7.00	6.14	2.06	11.84	0.00	0.00	19.16	4.62	0.00
7A383D0022	3.48	3.48	1.96	9.16	0.00	0.00	0.00	0.00	0.00
7A383D0861	5.74	4.16	2.86	9.00	0.00	0.00	0.00	3.26	0.00
7A383D0732	6.28	4.82	5.20	10.20	0.00	0.00	0.00	0.00	0.00
7A383D0659	8.34	6.88	4.12	9.00	0.00	0.00	17.06	3.78	0.00
7A383D0955	6.90	5.76	3.46	9.32	0.00	0.00	0.00	4.20	0.00
7A383D1438	5.40	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
7A383D1431	3.00	0.00	2.82	0.00	0.00	0.00	0.00	0.00	0.00
7A382C0369	7.12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
7A383C0023	8.72	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
7A383D0688	6.12	0.00	0.00	7.56	0.00	0.00	0.00	0.00	0.00
7A382C0512	3.08	0.00	2.86	7.52	0.00	0.00	0.00	0.00	0.00
7A382C0437	9.68	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
7A382C0458	6.08	0.00	0.00	9.40	0.00	0.00	0.00	0.00	0.00
7A383C0028	7.20	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
7A383D0078	3.86	0.00	0.00	9.82	0.00	0.00	0.00	0.00	0.00
7A383D0944	5.98	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
7A383A0049	4.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
7A383D1108	8.34	0.00	5.08	9.52	0.00	0.00	21.88	4.20	0.00
7A382C0135	7.74	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
7A382C0075	6.88	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
7A383D0368	8.70	0.00	0.00	9.48	0.00	0.00	0.00	0.00	0.00
7A383D0105	6.24	0.00	3.44	10.08	0.00	0.00	0.00	0.00	0.00
Triangular, concave-based									
7A383D0151	0.00	0.00	0.00	0.00	0.00	36.72	19.10	5.08	1.92
7A383D0308	0.00	0.00	0.00	0.00	0.00	20.98	12.48	2.86	1.68
7A382C0169	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
7A383D1005	0.00	0.00	0.00	0.00	0.00	28.18	0.00	0.00	0.00
7A383D0192	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Table 33b: **Endblade metric attributes continued**

ARTNO	NH	NW	ND	SW	NHL	L	W	T	LW
7A383D0252	0.00	0.00	0.00	0.00	0.00	0.00	18.28	5.40	0.00
7A383C0064	0.00	0.00	0.00	0.00	0.00	0.00	21.88	4.20	0.00
7A383D0842	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
7A382B0001	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
7A383D0170	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.18	0.00
Triangular, straight-based									
7A383D0990	0.00	0.00	0.00	0.00	0.00	50.72	20.60	4.34	2.46
7A383D1265									
7A383D0649	0.00	0.00	0.00	0.00	0.00	36.90	18.14	3.44	2.03
7A383D0306	0.00	0.00	0.00	0.00	0.00	33.26	14.18	3.14	2.34
7A383D0025	0.00	0.00	0.00	0.00	0.00	44.92	22.68	3.92	1.98
7A383D0028									
7A383D1045	0.00	0.00	0.00	0.00	0.00	36.88	22.24	3.44	1.66
7A383D1009									
7A383D0671	0.00	0.00	0.00	0.00	0.00	0.00	0.00	5.10	0.00
7A383D0587	0.00	0.00	0.00	0.00	0.00	0.00	0.00	4.16	0.00
7A383D1204	0.00	0.00	0.00	0.00	0.00	0.00	11.58	3.38	0.00
7A383D0411	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
7A382C0411	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
7A382C0207	0.00	0.00	0.00	0.00	0.00	0.00	17.18	3.54	0.00
7A383D0313	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
7A383D0502	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
7A382B0069	0.00	0.00	0.00	0.00	0.00	0.00	19.48	5.46	0.00
7A382C0453	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
7A382C0244	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Miscellaneous									
7A382C0247	0.00	0.00	0.00	0.00	0.00	24.84	13.76	3.50	1.81
7A382C0241	0.00	0.00	0.00	0.00	0.00	39.58	16.44	4.72	2.40
7A383D0686	0.00	0.00	0.00	0.00	0.00	50.32	21.88	5.10	2.30
7A383D0697									

Table 33b: Endblade metric attributes continued

ARTNO	NH	NW	ND	SW	NHL	L	W	T	LW
7A383D0565	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
7A383D0432	3.16	0.00	1.30	0.00	0.06	48.92	14.70	5.16	3.30
7A383D0010	0.00	0.00	0.00	0.00	0.00	0.00	21.32	5.10	0.00
7A383D0593	0.00	0.00	0.00	0.00	0.00	0.00	21.94	6.92	0.00
7A383D0084	0.00	0.00	0.00	0.00	0.00	43.64	25.00	7.34	5.95
7A382C0553	0.00	0.00	0.00	0.00	0.00	26.82	0.00	3.12	0.00
Fragmentary									
7A383C0026	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
7A383D0056	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
7A383D0792	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
7A383D0568	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
7A383D1205	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
7A383D1285	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
7A383D0193	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
7A383D0592	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
7A383D0702	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
7A382C0314	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
7A383D0381	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
7A383D0562	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
7A383D0229	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
7A382C0175	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
7A383D1023	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
7A383D0369	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
7A383D0127	0.00	0.00	0.00	0.00	0.00	0.00	15.90	3.30	0.00
7A382C0327	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
7A383C0024	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
7A382B0001	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
7A383D0584	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
7A382C0331	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
7A383D0822	0.00	0.00	0.00	0.00	0.00	0.00	15.54	4.46	0.00

Table 33b: Endblade metric attributes continued

ARTNO	NH	NW	ND	SW	NHL	L	W	T	LW
7A383C0018	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
7A382C0231	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
7A383D0972	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
7A383C0035	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
7A382C0098	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
7A383D0281	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
7A383D0102	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
7A382C0395	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
7A383D0634	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Table 34: Sideblade attributes

ARTNO	LEV	FEA	CON	ESAB	SR	ER	RM	PL	L	W	T
Ovate											
7A383D0733	3A	-	CO	CX/CX	PAR	B	CH	10:H	25.26	18.16	2.16
7A383D0067	2	2	CO	CX/CX	CO	B	CH	10:D	18.28	11.94	1.88
7A383A0031	2	-	I	CX/CX	CO	B	CH	10:B	0.00	13.94	2.26
7A383D0554	3A	-	I	CX/CX	CO	B	CH	10:A	23.70	0.00	2.56
7A383D0141	2	-	CO	CX/CX	CO	B	CH	10:G	24.28	15.48	3.18
7A382C0245	2	-	I	CX/CX	UD	PARB	CH	10:E	0.00	27.10	5.20
7A383D0893	3A	2A	CO	CX/CX	AB	PARB	CH	10:F	27.64	17.46	2.64
7A383D0570	3A	-	CO	CX/CX	CO	B	CH	10:C	18.22	11.08	2.26
Semi-lunate											
7A383D0660	3A	2A	CO	CX/CV	CO	B	CH	10:I	26.78	12.92	3.08
Triangular (Preform)											
7A383C0108	3	-	CO	CX/IR	PAR	PARB	CH	10:J	25.02	27.64	3.48
Fragmentary											
7A382C0475	3A	-	I	- / -	PR	B	CH	-	0.00	0.00	0.00
7A383D0536	3A	-	I	- / -	AB	B	CH	-	0.00	0.00	0.00
7A382C0344	3	-	I	- / -	AB	B	CH	-	0.00	0.00	0.00
7A383D1246	2	-	I	- / -	PR	B	CH	-	0.00	0.00	3.10

Table 35a: Knife non-metric attributes

ARTNO	LEV	FEA	CON	SY	ESAB	BS	BT	ER	SRVD	SGVD	TXS	LXS	HM	#N	RM	PL
7A383D0734	3A	-	CO	AS	CV/CX	ST	D	BF/G	PAR/PAR	PAR/PAR	PLCX	CVCX	SN/CN	1/1	CH	11:A
7A383D0626	3A	2A	CO	AS	IR/CX	CX	AB	BG	AB/AB	CO/CO	PLCX	CVCX	SN/CN	1/1	CH	11:B
7A382C0177	2	-	CO	AS	CV/ST	CX	B	B	CO/CO	AB/AB	BICX	BICX	SN/CN	1/1	CH	11:F
7A383D0392	3	-	CO	AS	ST/CX	ST	B	B	CO/CO	AB/AB	BICX	BICX	SN/CN	1/1	CH	-
7A383D0521	3A	-	CO	AS	CX/CX	CV	B	B	CO/CO	AB/AB	BICX	BICX	SN	1/1	CH	11:H
7A383D0059	2	-	CO	AS	CX/IR	ST	B	B	CO/PAR	AB/AB	BICX	BICX	SN	0/1	CH	11:G
7A382C0051	2	-	CO	SY	CX/IR	ST	B	B	CO/CO	AB/AB	BICX	CXIR	CN	1/1	CH	11:L
7A382C0325	3A	-	I	AS	ST/CX	ST	B	B	PR/PR	AB/AB	BICX	-	SN	1/1	CH	-
7A382C0443	3	-	I	AS	CV/IR	ST	B	B	PR/PR	AB/AB	BICX	-	SN	1/1	CH	11:J
7A382C0230	2	-	I	AS	-/-	CV	B	B	PR/PR	AB/AB	PLCX	-	SN	1/1	CH	11:M
7A383D0696	3A	-	I	AS	-/-	CV	D	B	PR/PR	AB/AB	BICX	-	SN/CN	1/1	CH	-
7A383D0132	2	-	I	AS	ST/CX	ST	B	B	PR/PR	AB/AB	BICX	-	SN/CN	1/1	CH	-
7A383D0823	3A	2A	I	AS	CX/IR	ST	AB	B	PR/PR	AB/AB	PLCX	-	AB	-/-	CH	-
7A382C0360	3	-	I	AS	-/-	ST	AB	B	PR/PR	AB/AB	BICX	-	SN	1/1	CH	-
7A382C0322	3A	-	I	AS	-/-	ST	B	B	PR/PR	AB/AB	BICX	-	SN	1/1	CH	-
7A382C0382	3A	8	I	AS	ST/CX	ST	V	B	PR/PR	AB/AB	BICX	-	SN	1/1	CH	11:E
7A383D0142	2	-	CO	AS	CX/CX	CX	B	B	CO/CO	AB/AB	BICX	BICX	SN/CN	1/1	CH	11:K
7A383D0803	3A	2A														
7A383D0715	3A	-														
7A382C0380	3	-	I	AS	-/-	CX	B	B	PR/PR	AB/AB	BICX	-	SN/CN	1/1	CH	-
7A382C0262	3	-	I	AS	CX/CX	IR	AB	PARB	PAR/PAR	AB/AB	PLCX	CVCX	AB	-/-	CH	11:I
7A382C0497	3A	-														
7A383A0085	3	-	I	SY	CX/-	-	-	B	PAR/PR	PAR/AB	BICX	-	-	-/-	CH	11:N
7A383D0231	2	-														
7A383D0124	2	-														
7A383D0168	2	2	I	AS	-/-	ST	B	B	PR/PR	AB/AB	BICX	-	CN	1/1	CH	-
7A383D0631	3	-	I	AS	ST/CX	ST	B	B	PR/PR	AB/AB	BICX	-	CN	0/1	CH	11:D
7A382B0040	2	-	I	AS	CX/CX	CX	B	B	PR/PR	AB/AB	BICX	-	SN	1/1	CH	11:C
7A383D0775	3	2A	I	-	-/-	ST	-	B	PR/PR	AB/AB	BICX	-	SN	1/1	CH	-
7A383D0331	2	2														

Table 35a: Knife non-metric attributes continued

ARTNO	LEV	FEA	CON	SY	ESAB	BS	BT	ER	SRVD	SGVD	TXS	LXS	HM	#N	RM	PL
7A383D0230	2	-	I	AS	- / -	-	-	B	PR/PR	AB/AB	BICX	-	-	- / -	CH	-
7A382C0012	2	-	I	-	- / -	ST	B	B	PAR/PR	AB/AB	BICX	-	CN	1 / 1	CH	-
7A382C0370	3A	-	I	AS	- / -	-	-	B	PR/PR	AB/AB	BICX	-	-	- / -	CH	-
7A382C0328	3	-														
7A382C0131	2	-	I	AS	CX/-	ST	D	B	PR/PR	AB/AB	BICX	-	AB?	- / -	CH	-
7A382C0077	2	-														
7A383C0061	2	-	I	AS	CX/CX	-	-	B	PR/PR	AB/AB	BICX	-	-	- / -	CH	-
7A382C0145	2	-	I	AS	- / -	-	-	B	PR/PR	AB/AB	BICX	-	-	- / -	CH	-
7A382C0239	2	-	I	AS	- / -	-	-	B	PR/PR	AB/AB	BICX	-	-	- / -	CH	-
7A383D0884	3A	2A	I	AS	- / -	-	-	B	PR/PR	AB/AB	BICX	-	-	- / -	CH	-
7A383D0397	2	-	I	-	- / -	-	-	B	PR/PR	AB/AB	BICX	-	?/SN	? / 1	CH	-
7A383D1458	3	-	I	-	- / -	ST	B	B	PR/PR	AB/AB	-	-	?/CN	- / -	CH	-

Table 35b: Knife metric attributes

ARTNO	NH	NW	ND	L	W	T
7A383D0734	4.32	9.38	2.68	51.58	27.02	5.08
7A383D0626	6.20	6.88	2.06	37.22	6.86	4.22
7A382C0177	2.60	6.48	1.30	51.84	19.46	3.84
7A383D0392	3.30	7.14	2.66	57.58	25.42	4.82
7A383D0521	2.76	4.10	2.08	59.16	30.48	4.74
7A383D0059	6.02	6.00	2.06	52.14	25.40	3.92
7A382C0051	0.00	6.46	1.92	65.34	42.20	5.12
7A382C0325	3.08	5.70	2.16	0.00	23.50	4.90
7A382C0443	3.06	5.56	1.50	0.00	36.02	4.70
7A382C0230	4.94	5.70	1.78	0.00	0.00	5.20
7A383D0696	8.54	0.00	0.00	0.00	0.00	0.00
7A383D0132	3.26	6.56	1.88	0.00	21.78	4.44
7A383D0823	0.00	0.00	0.00	0.00	18.90	4.62
7A382C0360	2.56	5.20	2.16	0.00	0.00	0.00
7A382C0322	4.90	4.28	1.70	0.00	0.00	0.00
7A382C0382	2.20	4.68	1.52	0.00	13.40	3.64
7A383D0142	5.18	7.60	2.32	66.04	27.26	4.64
7A383D0803						
7A383D0715						
7A382C0380	5.54	4.84	1.64	0.00	0.00	3.64
7A382C0262	0.00	0.00	0.00	50.52	0.00	5.40
7A382C0497	0.00	0.00	0.00	0.00	0.00	0.00
7A383A0085	0.00	0.00	0.00	0.00	0.00	0.00
7A383D0231						
7A383D0124						
7A383D0168	0.00	11.82	2.40	0.00	0.00	0.00
7A383D0631	0.00	4.10	1.58	0.00	17.54	2.66
7A382B0040	2.12	3.54	1.38	0.00	16.18	3.20
7A383D0775	0.00	0.00	0.00	0.00	0.00	0.00
7A383D0331						

Table 35b: Knife metric attributes continued

ARTNO	NH	NW	ND	L	W	T
7A383D0230	0.00	0.00	0.00	0.00	0.00	0.00
7A382C0012	0.00	0.00	0.00	0.00	0.00	0.00
7A382C0370	0.00	0.00	0.00	0.00	0.00	0.00
7A382C0328						
7A382C0131	0.00	0.00	0.00	0.00	0.00	0.00
7A382C0077						
7A383C0061	0.00	0.00	0.00	0.00	0.00	0.00
7A382C0145	0.00	0.00	0.00	0.00	0.00	0.00
7A382C0239	0.00	0.00	0.00	0.00	0.00	0.00
7A383D0884	0.00	0.00	0.00	0.00	0.00	0.00
7A383D0397	4.38	6.58	2.02	0.00	0.00	0.00
7A383D1458	1.42	5.00	3.14	0.00	0.00	0.00

Table 36a: Burin-like-tool non-metric attributes

ARTNO	LEV	FEA	CON	SRVD	SGVD	DES	PES	HM	#N	EDGEA	EDGEB	DEND	PEND	SI	RM	PL
Rectangular																
7A382C0048	2	-	CO	AB/AB	CO/CO	CX	ST	SN	1 / 1	DB VG/DF	BB BF	BB BG	BF	RI	CH	12:A
7A382C0394	3A	-	CO	PAR/PAR	PAR/PAR	CX	ST	SN	0 / 1	DB DF	BB BG/BF	BB BG	BF	RI	CH	12:B
7A383D0881	3A	2A	CO	AB/AB	CO/CO	ST	IR	SN	1 / 1	BB BG	BB BG/UW	BB BG/UW	BF	RI	CH	12:D
7A382C0272	3	-	I	AB/AB	PR/PR	ST	-	SN	? / ?	DB DG/UW	BB BG	BB BG	-	LE	CH	12:E
7A382C0250	3	-	I	AB/AB	PR/PR	ST	-	-	- / -	ST G	BB BG/UW	BB BG	-	RI	CH	12:F
7A383D0459	3A	-	I	AB/AB	PR/PR	ST	-	-	- / -	ST G	BB BF	BB BG	-	RI	CH	-
7A383D0292	2	2A	I	AB/AB	PR/PR	ST	-	-	- / -	DB DG	BB BG/UW	BB BG	-	RI	CH	-
7A383D0586	3A	-	I	AB/AB	PR/PR	ST	-	-	- / -	DB DG	BB BG/UW	BB BG	-	RI	CH	-
7A382C0114	2	-	I	AB/AB	PR/PR	ST	-	-	- / -	DB DG/DF	BB BG/UW	BB BG	-	RI	CH	12:G
7A383D0457	3	-	I	AB/AB	PR/PR	ST	-	-	- / -	BB BG	BB BG/UW	BB BG	-	RI	CH	-
7A383D0603	3	2A	I	AB/AB	PR/PR	ST	-	-	- / -	ST G	BB BF	BB BG	-	RI	CH	-
7A383D0639	3U	2A	I	AB/AB	PR/PR	ST	-	-	- / -	DB/2FA DG/DF	BB BF	BB BG/UW	-	RI	CH	-
7A383D0099	2	-	I	AB/AB	PR/PR	ST	-	-	- / -	BB BG	BB BG	BB BG	-	RI	CH	-
7A382C0333	3A	-	I	AB/AB	PR/PR	ST	-	-	- / -	DB/2FA DG	BB BF	BB BF	-	RI	CH	-
7A383C0016	3	2A	I	AB/AB	PR/PR	ST	-	-	- / -	DB/2FA DG	BB BG	BB BG	-	RI	CH	-
7A382C0436	3A	-	I	AB/AB	PR/PR	ST	-	-	- / -	BB BG	-	BB BG/UW	-	-	CH	-
7A382C0129	2	-	I	PAR/PAR	PAR/AB	ST	-	-	- / -	DB BF	BB BF	BB BF	-	RI	CH	12:H
7A383D0029	2	-	CO	PAR/PAR	PAR/PAR	CX	CX	SN	1 / 1	DB/2FA DG	BB BG/UW	BB BG/UW	BF	RI	CH	12:C
Triangular																
7A383D0518	3	2A	CO	AB/AB	CO/CO	CX	ST	SN	1 / 1	DB/2FA DG	BB BG/UW	BB BG/UW	BB BG	RI	CH	12:J
7A382C0409	3	-	CO	AB/AB	CO/CO	CX	ST	SN	0 / 1	DB DF	BB BF	BB DG/VF	BF	RI	CH	12:I
7A383D1389	2	2A	I	- / -	PR/PR	CX	-	-	- / -	DB DG	BB BG/UW	BB BG/UW	-	RI	CH	-
Angled tip																
7A382C0303	3	-	I	AB/PAR	CO/PAR	AN	-	-	- / -	DB/2FA DG	BB BF	BB BG	-	RI	CH	12:K
Fragmentary																
7A383D0859	3A	-	I	PAR/PAR	PAR/PAR	-	ST	SN	1 / 1	BB BF	DB BF	-	BF	LE	CH	-
7A383D0627	3A	2	I	PAR/PAR	PAR/PAR	-	CX	ST	- / -	DB DG	BB BG/UW	-	BF	RI	CH	-
7A383D0468	3A	-	I	PAR/PAR	AB/PAR	-	ST	SN	1 / 1	DB BF	BB BF	-	BF	RI	CH	-
7A383D0297	2	2	I	PAR/PAR	PAR/PAR	-	ST	SN	1 / ?	-	BB BG/UW	-	BF	RI	CH	-

Table 36a: Burin-like-tool non-metric attributes continued

ARTNO	LEV	FEA	CON	SRVD	SGVD	DES	PES	HM	#N	EDGEA	EDGEB	DEND	PEND	SI	RM	PL
7A382B0041	2	-	I	PAR/PAR	PAR/PAR	-	ST	SN	1 / ?	DB DG	-	-	BF	RI	CH	-
7A383D0905	2	2	I	PAR/PAR	PAR/PAR	-	ST	CN	1 / 1	BB BG	BB BG/UW	-	BF	RI	CH	-
7A382C0273	3	-	I	PAR/AB	PAR/PAR	-	-	-	-	-	-	-	-	-	CH	-
7A382C0367	3	-	I	PAR/PAR	PAR/PAR	-	ST	CN	? / ?	-	-	-	BF	-	CH	-
7A383D0646	3	-	I	PR/PR	PR/PR	-	ST	CN	? / ?	-	-	-	BF	-	CH	-
7A382C0174	2	-	I	PAR/PAR	PAR/PAR	-	ST	SN	1 / 1	DB DG	BB BF	-	BF	RI	CH	-
7A382C0089	2	-	I	AB/AB	PR/PR	-	ST	-	- / -	-	-	-	BF	-	CH	-
7A383D1284	2	2	I	AB/AB	PR/PR	-	CV	SN	1 / ?	-	-	-	BF	-	CH	-
7A383D0611	3A	-	I	PR/PR	PR/PR	-	ST	SN	1 / 1	-	-	-	BF	-	CH	-
7A383D0390	3	2A	I	PAR/PAR	PAR/PAR	-	ST	SN	0 / 1	BB BF	DB BF	-	BF	LE	CH	-
7A383D0032	3	-	I	PAR/PAR	PAR/PAR	-	CX	SN	1 / 1	DB BF	BB BF	-	BF	RI	CH	-
7A383D1042	3	2A	I	AB/AB	PR/PR	-	-	SN	? / ?	-	-	-	-	-	CH	-
7A383D1061	3A	2A	I	AB/AB	PR/PR	-	-	-	- / -	-	-	-	-	-	CH	-
7A382C0519	3A	-	I	AB/AB	PR/PR	-	-	-	- / -	DB DF	BB BF	-	-	RI	CH	-
7A383D0616	3A	2A	I	PAR/PAR	AB/PAR	-	-	-	- / -	-	-	-	-	-	CH	-
7A383D1303	3A	-	I	-	-	-	-	-	- / -	-	-	-	-	-	CH	-
7A382C0435	3A	-	I	-	-	-	-		- / -	-	-	-	-	-	CH	-
7A382C0534	3A	-	I	AB/PAR	PR/PAR	-	-	-	- / -	-	-	-	-	-	CH	-
7A382C0546	2	-	I	PR/AB	AB/PR	-	ST	-	- / -	-	-	-	BF	-	CH	-
7A383D1436	3A	9	I	AB/AB	PR/PR	-	-	-	- / -	-	-	-	-	-	CH	-

Table 36b: Burin-like-tool metric attributes

ARTNO	L	W	T
Rectangular			
7A382C0048	34.60	19.04	3.82
7A382C0394	30.64	17.26	4.00
7A383D0881	29.44	16.98	3.04
7A382C0272	0.00	0.00	3.00
7A382C0250	0.00	0.00	0.00
7A383D0459	0.00	0.00	0.00
7A383D0292	0.00	0.00	0.00
7A383D0586	0.00	0.00	0.00
7A382C0114	0.00	0.00	0.00
7A383D0457	0.00	0.00	0.00
7A383D0603	0.00	0.00	0.00
7A383D0639	0.00	0.00	0.00
7A383D0099	0.00	0.00	0.00
7A382C0333	0.00	0.00	0.00
7A383C0016	0.00	0.00	0.00
7A382C0436	0.00	0.00	3.88
7A382C0129	0.00	20.14	4.38
7A383D0029	25.36	15.84	3.70
Triangular			
7A383D0518	17.26	14.66	2.38
7A382C0409	22.56	21.54	3.10
7A383D1389	0.00	0.00	0.00
Angled tip			
7A382C0303	0.00	0.00	0.00
Fragmentary			
7A383D0859	0.00	0.00	3.14
7A383D0627	0.00	14.24	2.62
7A383D0468	0.00	15.30	3.74
7A383D0297	0.00	0.00	0.00

Table 36b: Burin-like-tool metric attributes continued

ARTNO	L	W	T
7A382B0041	0.00	0.00	0.00
7A383D0905	0.00	0.00	0.00
7A382C0273	0.00	0.00	0.00
7A382C0367	0.00	0.00	0.00
7A383D0646	0.00	0.00	0.00
7A382C0174	0.00	0.00	0.00
7A382C0089	0.00	0.00	0.00
7A383D1284	0.00	0.00	0.00
7A383D0611	0.00	0.00	0.00
7A383D0390	0.00	0.00	0.00
7A383D0032	0.00	18.28	4.10
7A383D1042	0.00	0.00	0.00
7A383D1061	0.00	0.00	0.00
7A382C0519	0.00	0.00	0.00
7A383D0616	0.00	0.00	0.00
7A383D1303	0.00	0.00	0.00
7A382C0435	0.00	0.00	0.00
7A382C0534	0.00	0.00	0.00
7A382C0546	0.00	0.00	0.00
7A383D1436	0.00	0.00	0.00

Table 37: Endscraper attributes

ARTNO	LEV	FEA	CON	WES	ESY	LERAB	SRVD	HM	BT	SNUB	GS	EC	RM	PL	L	W	T	WEC
Rectangular, straight-sided																		
7A382C0249	2	-	I	CX	-	B/-	AB/AB	AB	AB	PR	LE/?	AB	CH	-	25.32	0.00	5.26	0.00
7A383D1024	3	2A	CO	CX	SY	AB/V	AB/AB	AB	V	PR	AB	AB	CH	13:N	28.80	0.00	8.10	34.00
7A383D0333	2	2A,5	CO	CX	SY	B/V	AB/AB	AB	B	PR	AB	RI	CH	13:L	33.40	33.10	8.62	33.40
7A383D0092	2	-	CO	CX	SY	AB/AB	AB/PAR	ST	B	AB	LE	RI	CH	-	26.80	29.02	6.68	29.02
7A383D0835	3A	2A	CO	CX	SY	D/D	AB/CO	AB	D	PR	AB	AB	CH	-	31.40	32.26	6.90	31.14
7A382B0017	2	-	I	CX	AS	D/B	AB/AB	-	-	PR	RI	LE	CH	-	0.00	27.00	4.60	27.00
7A383D0932	2	2A	CO	CX	AS	B/B	AB/AB	AB	AB	PR	LE	RI	CH	-	31.00	23.38	5.40	23.38
7A383D0431	3	-	CO	CX	SY	B/PARB	AB/PAR	AB	B	PR	AB	AB	CH	13:K	29.06	35.28	6.66	35.28
7A383D0422	3	-	CO	CX	AS	AB/AB	PAR/PAR	ST?	B	PR	BO	AB	CH	13:F	22.00	23.40	4.50	23.40
7A383D0679	3A	-	CO	CX	AS	B/B	AB/CO	ST	B	PR	BO	AB	RC	13:I	33.04	37.86	7.30	37.86
7A383D0506	3	2A	CO	CX	SY	B/B	AB/PAR	ST	B	AB	AB	AB	CH	13:H	31.18	25.62	6.24	25.62
7A382C0451	3A	-	CO	CX	SY	UT?/D	AB/PAR	AB	D	PR	AB	BO	CH	13:M	31.70	35.60	7.92	35.60
7A383D0357	3	2A	I	CX	SY	B/B	AB/PR	-	-	PR	BO	AB	CH	-	0.00	18.32	4.36	18.32
7A383D0830	3A	2A,10	CO	CX	AS	AB/AB	AB/PAR	ST	B	PR	BO	AB	CH	13:G	22.60	26.40	5.64	26.40
7A383D1070	3A	2A	C0	CX	AS	B/B	AB/AB	AB	B	PR	AB	BO	CH	-	17.40	26.78	5.26	26.78
7A383D0504	3	2A	C0	ST	SY	B/D	AB/PAR	AB	B	PR	AB	BO	CH	13:A	18.00	23.86	4.44	23.86
7A382C0386	3	-	CO	CX	AS	B/B	AB/AB	AB	AB	PR	AB	BO	CH	13:D	24.72	18.54	8.74	18.54
7A382C0233	2	-	CO	CX	SY	D/D	AB/PAR	AB	AB	AB	AB	AB	CH	-	20.50	20.00	3.54	20.00
7A382C0399	3A	-	CO	CX	SY	B/B	AB/PAR	AB	B	PR	AB	BO	CH	13:B	19.78	24.24	6.28	24.24
7A382C0053	2	-	CO	CX	SY	D/D	AB/PAR	SN	B	AB	LE	RI	CH	13:C	20.78	25.00	6.18	25.00
7A383D0464	3A	-	CO	CX	SY	AB/AB	AB/AB	ST	AB	PR	BO	AB	CH	-	29.16	27.12	5.52	27.12
7A383D0605	3A	2A	CO	CX	SY	D/D	AB/CO	ST	B	PR	BO	AB	CH	13:E	20.60	25.80	4.88	25.80
7A383D0467	3A	-	CO	CX	AS	AB/AB	CO/AB	ST	B	AB	BO	AB	CH	-	26.68	29.54	6.28	29.54
7A383D0691	3A	-	CO	CX	SY	B/B	AB/CO	SN	D	PR	AB	AB	CH	-	22.66	27.94	6.00	27.56
7A382C0127	2	-	CO	CX	AS	AB/UT	AB/AB	AB	B	PR	AB	AB	CH	-	23.14	26.80	5.36	26.26
7A383D0804	3A	2A,5	CO	CX	AS	D/V	AB/AB	AB	D	PR	AB	BO	CH	13:J	36.08	31.28	6.00	31.62
7A383D0481	3A	2A	I	CX	AS	D/D	PAR/PAR	AB	AB	AB	AB	AB	CH	-	0.00	21.88	7.36	20.36
7A382B0003	2	-	I	CX	SY	D/D	AB/AB	AB	-	PR	BO	AB	CH	-	0.00	25.50	4.58	25.50
7A382C0285	3	-	C0	CX	AS	D/D	AB/AB	AB	AB	PR	AB	RI	CH	-	19.78	22.62	4.08	22.46

Table 37: Endscraper attributes continued

ARTNO	LEV	FEA	CON	WES	ESY	LERAB	SRVD	HM	BT	SNUB	GS	EC	RM	PL	L	W	T	WEC
Rectangular, concave-sided/side-notched																		
7A383D0862	3A	-	CO	CX	SY	AB/AB	AB/CO	ST	B	AB	BO	AB	CH	14:G	29.48	28.94	7.08	28.94
7A383D0699	3A	-	CO	CX	AS	AB/AB	PAR/AB	SN	B	PR	BO	AB	CH	14:C	19.32	28.04	5.34	28.04
7A383D0482	3	2,7	CO	CX	AS	AB/AB	AB/AB	SN	D	PR	AB	AB	CH	-	21.40	19.94	5.44	18.92
7A383D1008	3	2	I	CX	AS	AB/AB	AB/PAR	-	-	PR	B0	AB	CH	-	0.00	30.58	6.58	30.58
7A383D0657	3A	-	CO	CX	AS	AB/UT	AB/AB	SN	D	PR	AB	AB	CH	14:H	28.00	30.80	6.62	30.80
7A383D0748	3A	2A	CO	CX	SY	AB/AB	AB/PAR	ST	B	PR	AB	BO	CH	-	27.96	31.00	6.28	30.94
7A383D0643	3	-	CO	CX	SY	AB/AB	AB/PAR	SN	B	PR	BO	AB	CH	14:F	28.34	28.04	7.00	28.04
7A383D0075	2	-	I	CX	AS	B/B	AB/PR	SN	-	AB	AB	AB	CH	-	0.00	24.22	5.08	24.22
7A382C0108	2	-	CO	CX	SY	AB/AB	PAR/AB	SN	B	PR	BO	AB	CH	14:E	24.76	25.02	5.14	25.02
7A383D0469	3A	-	CO	CX	SY	AB/AB	AB/PAR	ST	B	PR	BO	AB	CH	14:D	21.06	27.27	5.06	27.27
7A382C0489	3A	-	CO	CX	SY	AB/AB	AB/PAR	SN	B	PR	BO	AB	CH	14:A	17.00	23.40	5.68	23.40
7A383D0567	3A	-	CO	CX	AS	D/D	AB/CO	ST	B	PR	BO	AB	CH	-	20.90	24.32	7.48	24.32
7A383A0110	2	-	CO	CX	SY	B/B	AB/AB	SN	B	PR	BO	AB	CH	14:B	23.00	27.46	5.74	27.46
7A383A0043	2	-	CO	CX	SY	AB/AB	PAR/CO	ST	B	AB	BO	AB	CH	14:I	35.32	36.26	5.62	36.26
7A383D0201	2	-	CO	CX	AS	D/B	AB/PAR	SN	D	PR	AB	BO	CH	-	19.76	22.66	4.94	22.66
7A383D0209	2	-	I	ST	SY	D/D	AB/AB	ST?	-	AB	AB	AB	CH	-	23.98	19.48	4.12	19.48
7A383D0837	3A	-	CO	CX	SY	AB/AB	AB/PAR	SN	D	PR	BO	AB	CH	-	20.90	26.38	7.36	26.38
Flake																		
7A383D0692	3A	-	CO	CX	SY	UT/UT	AB/AB	AB	AB	PR	AB	BO	CH	14:J	29.26	18.66	5.28	18.66
7A383D0855	3A	2A,9	CO	CX	AS	D/D	AB/AB	AB	AB	PR	AB	AB	CH	14:K	27.56	23.14	4.24	23.14
7A383A0030	2	-	CO	CX	AS	AB/UT	AB/AB	AB	AB	PR	AB	AB	CH	-	28.10	23.90	5.76	23.36
7A382C0214	2	-	CO	CX	AS	UT/UT	AB/AB	AB	AB	PR	AB	AB	CH	-	28.68	21.84	4.76	21.14
7A382C0536	2	-	CO	CX	SY	UT/UT	AB/AB	AB	AB	PR	AB	RI	CH	14:L	29.42	20.56	3.90	20.06
7A382C0283	3	-	C0	CX	SY	UT/UT	AB/AB	AB	AB	PR	LE/?	AB	CH	-	24.72	18.54	8.74	18.54
7A382C0366	3	-	CO	CX	SY	UT/UT	AB/AB	AB	AB	PR	AB	BO	CH	14:M	29.08	25.66	6.02	25.66
7A382C0132	2	-	CO	CX	AS	UT/UT	AB/AB	ST	B	AB	AB	AB	CH	-	26.68	29.54	6.28	29.54

Table 37: Endscraper attributes continued

ARTNO	LEV	FEA	CON	WES	ESY	LERAB	SRVD	HM	BT	SNUB	GS	EC	RM	PL	L	W	T	WEC
Triangular																		
7A383D0197	2	-	CO	CX	SY	UT/UT	AB/AB	AB	AB	PR	AB	AB	CH	15:H	34.92	32.08	8.62	32.08
7A383D0992	3A	2A	CO	CX	AS	B/B	AB/CO	AB	AB	AB	AB	AB	CH	15:G	29.96	28.69	3.90	28.69
7A382C0374	3	-	CO	CX	SY	D/D	AB/PAR	AB	AB	PR	AB	AB	CH	-	22.22	23.56	4.08	23.56
7A382C0150	2	-	I	CX	SY	UT/-	AB/AB	AB	D	PR	AB	AB	CH	-	20.64	0.00	5.00	0.00
7A383D0772	3	2A	CO	CX	AS	D/D	AB/AB	AB	AB	AB	AB	AB	CH	-	25.00	21.00	4.04	21.00
7A383D0393	3	-	CO	CX	SY	D/D	AB/AB	AB	D	PR	AB	AB	CH	15:E	22.64	17.56	6.38	17.12
7A382C0076	3	-	CO	ST	SY	D/D	AB/AB	AB	D	PR	AB	AB	CH	15:D	18.14	16.00	2.78	16.00
7A382C0340	3	-	CO	CX	AS	B/D	AB/AB	AB	AB	PR	AB	BO	CH	-	17.58	15.32	4.12	15.12
7A383D0721	3U	-	CO	CX	AS	D/D	AB/AB	AB	AB	PR	AB	AB	CH	15:A	17.64	19.90	4.90	19.90
7A383D0453	3	-	CO	CX	SY	D/D	AB/AB	AB	AB	PR	AB	AB	CH	15:B	16.68	15.38	4.42	15.38
7A383D0002	2	-	I	CX	SY	D/D	AB/PAR	AB	AB	PR	AB	AB	CH	15:C	16.62	0.00	3.84	0.00
7A383D0334	2	2A,5	I	CX	AS	D/D	AB/CO	AB	AB	PR	AB	AB	CH	-	0.00	13.88	4.53	13.88
7A383D0816	3A	2A	I	CX	AS	-/AB	AB/AB	AB	D	PR	AB	AB	CH	-	0.00	0.00	5.48	0.00
7A383D0338	2	-	I	CX	SY	D/D	AB/AB	-	-	PR	AB	BO	CH	-	13.48	19.04	2.76	19.04
7A383D0273	2	2A	I	CX	SY	D/UT	AB/AB	-	-	PR	AB	RI	CH	-	0.00	14.98	3.00	14.98
7A383D0373	3	-	CO	CX	SY	B/B	AB/PAR	AB	D	AB	AB	AB	CH	-	25.68	18.38	3.46	18.08
7A382C0178	2	-	CO	CX	AS	UT/UT	AB/PAR	AB	AB	PR	AB	BO	CH	15:J	32.98	26.74	8.90	26.74
7A383D0203	2	-	I	CX	AS	D/D	AB/AB	-	-	PR	AB	BO	CH	-	30.88	20.62	6.78	20.62
7A383D0420	3	-	CO	CX	AS	D/D	AB/PAR	AB	D	PR	AB	AB	CH	15:F	30.96	31.70	5.84	31.70
7A382C0219	2	-	I	CX	-	D/AB	AB/AB	-	AB	PR	AB	AB	CH	-	22.44	0.00	5.48	0.00
7A382C0176	2	-	CO	CX	AS	B/B	PAR/PAR	AB	AB	PR	AB	AB	CH	15:I	43.82	28.94	6.32	28.94
7A383D0163	2	2	CO	CX	SY	B/B	AB/CO	SN	AB	PR	BO	AB	CH	15:K	30.66	28.70	6.66	28.70
7A383D0125	2	-	CO	CX	AS	D/D	AB/PAR	SN	AB	PR	AB	RI	CH	15:L	25.84	18.14	4.36	18.14
Miscellaneous																		
7A383D1036	3A	2A	CO	CX	AS	B/B	CO/CO	SN	V	AB	AB	AB	CH	15:P	26.00	16.74	4.92	15.08
7A383D0183	2	-	I	CX	SY	UT/UT	AB/AB	-	-	AB	AB	AB	CH	15:M	0.00	22.08	9.88	22.08
7A382C0321	3A	-	CO	CX	AS	AB/UT	AB/AB	AB	AB	PR	AB	AB	CH	15:N	45.00	21.68	10.96	21.62
7A382C0280	3	-	CO	CX	AS	B/B	PAR/AB	AB	AB	PR	AB	AB	CH	15:O	30.66	20.50	5.68	20.50

Table 37: Endscraper attributes continued

ARTNO	LEV	FEA	CON	WES	ESY	LERAB	SRVD	HM	BT	SNUB	GS	EC	RM	PL	L	W	T	WEC
Fragmentary																		
7A383D0633	3	-	I	CX	SY	D/B	AB/CO	-	-	PR	AB	AB	CH	-	0.00	0.00	0.00	0.00
7A383D0916	3	2	CO	CX	AS	D/D	AB/PAR	AB	D	PR	AB	BO	CH	-	19.34	19.20	5.10	19.32
7A383C0071	2	-	I	CX	AS	D/D	AB/PAR	-	-	PR	AB	RI	CH	-	0.00	20.26	5.16	20.26
7A383D0100	2	-	I	CX	SY	B/D	AB/CO	-	-	PR	AB	AB	CH	-	0.00	17.26	5.54	15.56
7A383D0117	2	-	I	CX	SY	D/D	AB/PR	-	-	PR	AB	AB	CH	-	0.00	23.40	4.98	23.40
7A383D0412	3	-	I	CX	AS	D/D	AB/PR	-	-	AB	AB	AB	CH	-	0.00	0.00	5.08	37.82
7A382C0017	2	-	I	-	-	D/D	AB/AB	-	-	-	AB	AB	CH	-	0.00	16.92	3.14	16.92
7A383D0048	2	-	I	CX	-	- / -	- / -	-	-	AB	-	-	CH	-	0.00	0.00	0.00	0.00
7A383D0215	2	-	I	-	-	- / -	- / -	-	-	-	-	-	CH	-	0.00	0.00	0.00	0.00
7A383D0900	2	2	I	CX	AS	- / D	AB/AB	-	-	PR	AB	AB	CH	-	0.00	0.00	3.80	19.00

Table 38: Microblade/blade attributes

ARTNO	LEV	FEA	SEG	ERA	ERB	HM	# A	RM	PL	L	W1	W2	T
7A382C0388	3A	-	MED	AB	AB	-	1	CH	-	22.88	8.24	8.12	1.52
7A383D0596	3U	-	PRO	AB	AB	AB	1	CH	-	21.16	7.96	7.72	1.66
7A382C0375	3A	-	DIS	AB	AB	-	1	CH	-	13.22	0.00	6.38	1.90
7A383D0669	3A	-	MED	AB	AB	-	1	CH	-	12.46	6.08	6.00	1.24
7A383D0680	3A	-	PRO	AB	AB	AB	2	CH	-	15.32	5.38	5.00	1.02
7A382C0320	3A	-	PRO	AB	AB	AB	2	CH	-	15.32	7.72	7.48	1.60
7A382C0335	3A	-	DIS	AB	AB	-	1	CH	-	15.12	6.70	6.66	1.16
7A383D0880	3A	-	MED	AB	AB	-	2	CH	-	14.68	8.82	8.04	2.20
7A382C0195	2	-	MED	AB	AB	-	3	CH	-	12.16	8.20	8.16	1.30
7A382B0045	2	-	PRO	UT	UT	AB	1	CH	-	25.50	9.00	8.98	1.64
7A383D1007	3	-	DIS	RET	UT	-	2	CH	-	22.76	9.40	9.30	2.22
7A383D0439	3A	-	DIS	AB	AB	-	1	CH	-	11.08	0.00	7.10	1.28
7A382C0513	3	-	DIS	AB	AB	-	1	CH	-	12.14	8.24	7.40	1.46
7A382C0268	3	-	PRO	AB	AB	-	1	CH	-	9.82	6.98	6.28	1.54
7A382C0300	3	-	MED	AB	UT	-	2	CH	-	11.72	6.64	6.40	1.64
7A382C0044	2	-	PRO	AB	UT	AB	1	CH	-	10.18	4.32	3.88	0.90
7A383D0877	3A	-	PRO	AB	AB	AB	2	CH	-	22.54	8.06	7.62	2.64
7A383D0887	3A	2A	PRO	AB	AB	AB	1	CH	-	21.68	6.18	5.70	1.44
7A383A0102	2	-	PRO	AB	AB	AB	2	CH	-	14.28	6.38	5.90	1.32
7A382C0046	2	-	MED	AB	AB	-	1	CH	-	21.32	5.04	4.36	1.66
7A383D0617	3A	-	PRO	AB	AB	AB	2	CH	-	25.68	9.08	9.02	1.80
7A382C0311	3	-	PRO	UT	AB	AB	1	CH	-	18.24	7.66	7.62	1.50
7A383D0132	2	-	DIS	AB	AB	-	1	CH	-	7.04	4.98	4.94	1.12
7A383D0438	3A	-	MED	AB	AB	-	1	CH	-	16.38	5.80	5.70	1.60
7A382D0267	3	-	PRO	AB	AB	AB	1	CH	-	15.82	5.28	4.24	1.78
7A382C0055	2	-	MED	AB	AB	-	1	CH	16:F	26.02	8.64	8.64	3.32
7A382C0095	2	-	CO	UT	AB	AB	2	CH	-	33.94	10.18	7.48	3.22
7A383D0316	2	2A	MED	AB	AB	-	1	CH	-	34.18	0.00	7.72	0.00
7A382C0064	2	-	PRO	AB	UT	AB	1	CH	-	22.00	8.80	7.74	2.20
7A383D1068	3A	-	MED	AB	AB	-	2	CH	-	13.68	9.66	9.62	2.00
7A383C0017	3	-	MED	AB	AB	-	2	CH	-	22.80	9.94	9.90	2.38
7A383D1247	2	-	MED	AB	AB	-	1	CH	-	31.14	9.28	9.12	2.10
7A382C0138	2	-	DIS	AB	AB	-	1	CH	-	24.50	0.00	9.16	2.68
7A383D0588	3U	-	DIS	AB	UT	-	1	CH	-	25.68	8.74	8.72	1.86
7A383D1092	2	-	MED	AB	AB	-	2	CH	-	16.26	0.00	9.14	1.88
7A383D0134	2	-	MED	AB	AB	-	1	CH	-	14.60	6.24	6.24	2.22
7A382C0504	3A	-	PRO	AB	AB	-	1	CH	-	13.72	0.00	7.52	0.00
7A383D0647	3	-	PRO	AB	AB	-	1	CH	-	19.56	9.78	8.34	2.02
7A382C0307	3	-	MED	AB	AB	-	2	CH	-	17.52	9.72	9.66	2.50
7A382B0052	2	-	MED	AB	AB	-	1	CH	-	11.38	0.00	9.62	1.24
7A383D0703	3A	-	MED	AB	AB	-	2	CH	-	10.78	8.44	8.38	1.36
7A383D0493	3	-	PRO	AB	AB	AB	2	CH	-	20.38	8.68	8.26	2.68
7A382C0157	2	-	PRO	AB	AB	AB	2	CH	-	17.00	10.10	10.26	1.88
7A383D0961	2	-	MED	AB	AB	-	2	CH	-	6.82	9.06	8.84	1.64
7A383D0225	2	-	MED	AB	AB	-	1	CH	-	13.78	0.00	5.68	1.38
7A383D0196	2	-	MED	AB	UT	-	1	CH	-	12.38	9.52	9.46	1.98

Table 38: Microblade/blade attributes continued

ARTNO	LEV	FEA	SEG	ERA	ERB	HM	# A	RM	PL	L	W1	W2	T
7A382C0147	2	-	PRO	AB	AB	-	2	RC	-	29.26	9.36	9.18	3.10
7A382C0362	3	-	MED	RET	AB	-	1	RC	-	13.12	0.00	0.00	1.10
7A383D0878	3A	-	PRO	AB	AB	AB	2	RC	-	12.72	7.18	6.54	1.52
7A382C0096	2	-	MED	AB	AB	-	2	RC	-	9.30	6.28	6.18	1.54
7A383D0079	2	-	MED	AB	AB	-	1	RC	-	9.74	6.18	5.96	1.86
7A382C0341	3	-	MED	UT?	UT?	-	1	CH	16:L	41.40	10.82	10.66	2.44
7A383D0433	3	-	MED	UT?	UT?	ST	2	CH	-	45.12	10.28	10.18	1.56
7A383D0809	3A	-	DIS	AB	AB	-	2	CH	-	23.32	10.84	10.80	1.78
7A382C0234	2	-	DIS	AB	AB	-	1	CH	-	26.94	9.12	8.82	2.12
7A382C0424	3A	-	PRO	AB	AB	AB	1	CH	-	23.22	7.78	7.34	2.16
7A383D1100	2	-	PRO	AB	AB	AB	2	CH	-	19.66	7.46	7.44	1.80
7A383D0472	3	2	PRO	AB	AB	AB	2	CH	-	23.12	8.84	8.24	2.24
7A383D0839	3A	-	MED	AB	AB	-	2	RC	-	23.66	6.62	6.34	2.10
7A383D0320	2	-	MED	UT?	AB	-	1	CH	-	17.90	8.30	7.56	1.78
7A383D0210	2	-	MED	UT?	AB	-	2	CH	-	8.30	8.90	8.34	2.68
7A383D0237	2	2A	MED	UT?	AB	-	1	CH	-	12.36	8.44	8.34	2.68
7A383D0227	2	-	PRO	AB	AB	AB	1	CH	-	24.74	8.84	7.76	1.34
7A383D0152	2	2	DIS	AB	AB	-	1	CHA	-	18.80	8.68	8.66	2.18
7A383D0276	2	-	MED	AB	AB	-	1	CH	-	18.64	0.00	10.28	1.96
7A383D0582	3A	-	MED	AB	AB	-	1	CHA	-	27.00	10.96	10.92	2.60
7A383D0581	3A	-	PRO	AB	AB	AB	2	CH	-	21.14	9.20	9.18	1.54
7A383D0957	2	-	MED	UT	AB	-	2	CH	-	29.82	10.14	9.02	3.58
7A383D0454	3	-	PRO	AB	AB	AB	1	CH	-	34.32	12.32	10.22	2.40
7A382C0378	3	-	PRO	UT	UT	AB	1	CH	-	21.18	7.00	6.84	1.98
7A383C0027	3A	-	MED	UT	-	-	1	CH	-	12.86	5.86	5.84	1.22
7A382C0083	2	-	PRO	UT	AB	AB	2	CH	-	14.22	8.18	7.00	1.58
7A382C0161	2	-	PRO	AB	AB	AB	1	CH	-	12.16	5.14	4.84	1.00
7A383D0387	3	-	MED	AB	AB	-	2	CH	-	14.48	7.72	7.08	1.10
7A383D0988	3U	-	PRO	AB	AB	AB	1	CH	-	15.82	8.16	8.00	1.74
7A383D0391	3	-	PRO	AB	AB	AB	1	CH	-	26.00	10.24	10.20	1.54
7A383D0178	2	-	MED	AB	AB	-	1	CH	-	18.48	8.46	8.40	1.90
7A383D0492	3	2A	PRO	AB	AB	AB	1	CH	-	15.44	8.46	8.34	2.76
7A382C0173	2	-	MED	AB	AB	-	1	CH	-	16.58	8.04	8.00	2.42
7A382C0154	2	-	MED	AB	AB	-	1	CH	-	16.98	8.86	8.84	4.06
7A382C0418	3A	-	MED	UT?	AB	-	1	CH	-	21.08	10.38	10.26	1.68
7A382C0404	3	-	DIS	AB	AB	-	3	CH	-	37.88	0.00	10.32	2.76
7A383D0547	3A	-	DIS	UT	UT	-	1	CH	16:N	45.82	10.92	10.68	3.80
7A383D0817	3A	-	DIS	AB	UT	-	1	CH	-	32.52	7.16	6.96	2.64
7A383D0546	3A	-	MED	AB	AB	-	2	CH	-	28.34	9.64	9.64	2.64
7A383D0687	3A	-	DIS	AB	AB	-	3	CH	-	25.86	7.56	7.46	1.98
7A382C0419	3A	-	PRO	AB	AB	AB	1	CH	-	18.64	8.54	7.98	4.08
7A383D0440	3A	-	MED	AB	AB	-	1	CH	-	15.78	9.60	9.58	2.76
7A383D1097	2	-	PRO	AB	AB	AB	1	CH	-	33.84	9.32	9.22	2.36
7A383D0147	2	-	PRO	RET	RET	AB	2	CH	16:M	46.18	10.66	8.96	2.56
7A383D0828	3A	-	MED	AB	AB	-	2	CH	-	32.26	9.82	9.08	2.88
7A383D0088	2	-	MED	UT	UT	-	2	CH	-	24.30	9.72	9.72	2.40

Table 38: Microblade/blade attributes continued

ARTNO	LEV	FEA	SEG	ERA	ERB	HM	# A	RM	PL	L	W1	W2	T
7A382C0304	3	-	DIS	AB	AB	-	1	CH	-	26.98	10.38	9.90	2.88
7A382C0208	2	-	PRO	UT?	AB	AB	2	CH	-	31.78	9.12	7.62	1.82
7A383D1004	3	2A	PRO	UT	UT	AB	2	CH	-	30.72	10.58	9.98	2.26
7A382C0124	2	-	MED	AB	AB	-	2	CH	-	25.54	10.70	8.92	2.16
7A382C0398	3A	-	PRO	RET	RET	AB	3	CH	-	29.64	10.52	7.92	2.06
7A383D0184	2	-	MED	AB	AB	-	2	CH	-	17.88	0.00	10.12	1.88
7A383D0755	3A	-	DIS	AB	AB	-	1	CH	-	20.88	7.00	6.96	2.10
7A383D0112	2	-	MED	AB	AB	-	2	CH	-	18.30	0.00	9.62	2.20
7A383D1000	3	-	DIS	AB	AB	-	1	CH	16:G	26.58	8.24	6.62	1.96
7A382C0474	3A	-	MED	AB	AB	-	2	CH	-	14.04	7.18	7.16	1.36
7A383D0833	3A	-	MED	AB	AB	-	2	CH	-	19.78	8.78	8.64	2.28
7A383D0514	3	-	PRO	AB	AB	AB	2	CH	-	27.00	10.78	10.24	2.16
7A383D0785	3	-	PRO	AB	AB	AB	2	CH	-	20.32	9.62	6.90	2.24
7A383D0421	3	-	MED	AB	AB	-	1	CH	-	21.88	7.06	6.66	1.38
7A382C0318	3A	-	MED	AB	AB	-	1	CH	-	16.92	7.42	7.34	2.50
7A383D0548	3A	-	DIS	AB	AB	-	2	CH	-	24.52	9.84	9.42	1.70
7A382C0393	3A	-	DIS	AB	AB	-	2	CH	-	22.52	9.62	9.32	2.00
7A383D0075	2	-	MED	AB	AB	-	1	CH	-	30.24	9.92	9.90	3.18
7A382C0063	2	-	PRO	AB	AB	AB	2	CH	-	23.66	8.90	7.22	1.68
7A383D1034	3A	-	PRO	UT?	AB	AB	1	CH	-	27.30	9.32	5.98	1.90
7A383A0051	2	-	MED	AB	AB	-	1	CH	-	28.72	6.26	5.90	1.82
7A383D0122	2	-	PRO	AB	AB	AB	1	CH	-	16.38	8.44	8.40	2.20
7A383D0724	3U	-	PRO	AB	AB	AB	2	CH	16:H	24.88	6.98	6.60	1.34
7A383D0651	3	-	DIS	AB	AB	-	2	CH	-	25.56	10.68	9.22	2.18
7A382C0171	2	-	CO	AB	AB	AB	1	CH	-	36.20	8.82	8.76	2.80
7A382C0439	3A	-	MED	AB	AB	-	1	CH	-	13.20	7.20	5.68	1.30
7A383D1067	3A	-	DIS	AB	AB	-	1	CH	-	16.18	8.30	8.24	1.48
7A383D1035	3A	-	CO	AB	AB	AB	1	CH	-	26.44	10.08	7.36	3.00
7A383D0644	3	-	PRO	AB	AB	AB	2	CH	-	18.04	7.48	7.00	2.10
7A383C0069	3	-	DIS	-	AB	-	1	CH	-	10.98	0.00	0.00	1.54
7A383D0087	2	-	PRO	AB	AB	AB	1	CH	-	19.84	8.90	8.44	1.86
7A383D0723	3U	-	DIS	AB	AB	-	1	CH	-	14.10	7.36	5.96	1.28
7A383D0673	3A	-	DIS	AB	AB	-	2	CH	-	12.12	8.04	8.00	1.80
7A382C0192	2	-	DIS	AB	AB	-	2	CH	-	18.74	10.12	8.82	4.72
7A382B0047	2	-	PRO	AB	AB	AB	1	CH	-	10.82	6.70	5.78	1.72
7A383C0072	2	-	PRO	AB	AB	AB	2	CH	-	14.02	10.26	10.12	1.04
7A383D0760	3A	-	PRO	AB	AB	AB	2	CH	-	25.22	7.76	6.76	2.30
7A383D0597	3U	-	DIS	AB	AB	-	1	CH	-	37.92	10.00	8.86	3.94
7A383D0773	3	-	PRO	AB	AB	AB	1	CH	-	25.82	8.24	8.22	2.06
7A382C0102	2	-	PRO	AB	AB	AB	1	CH	-	12.86	6.02	5.72	1.18
7A382C0101	2	-	DIS	AB	AB	AB	1	CH	-	13.82	7.92	7.92	1.26
7A383D0628	3A	-	DIS	AB	AB	AB	1	CH	-	14.42	10.18	9.16	1.78
7A382C0082	2	-	PRO	AB	AB	AB	1	CH	-	18.54	10.26	8.78	1.96
7A383D0053	2	-	PRO	AB	AB	AB	2	CH	-	14.54	9.08	7.68	3.00
7A382C0259	3	-	DIS	RET	RET	-	1	CH	-	23.46	10.34	9.22	2.04
7A383D1101	2	-	DIS	AB	UT?	AB	1	CH	-	22.30	0.00	10.78	0.00

Table 38: Microblade/blade attributes continued

ARTNO	LEV	FEA	SEG	ERA	ERB	HM	# A	RM	PL	L	W1	W2	T
7A383D0272	2	-	DIS	AB	AB	-	2	CH	-	24.74	0.00	10.50	4.22
7A383D1240	2	2	DIS	UT	AB	-	2	CH	-	21.76	10.18	9.32	1.66
7A383D0622	3A	-	PRO	AB	AB	AB	1	CH	-	21.58	10.48	10.38	1.62
7A383D0484	3	2	MED	AB	AB	-	1	CH	-	12.74	6.92	6.92	2.84
7A383D1022	3U	-	MED	AB	AB	-	1	CH	-	17.78	7.46	7.38	2.16
7A382C0315	3	-	MED	AB	AB	-	3	CH	-	19.10	10.76	10.48	1.22
7A382C0354	3A	-	MED	UT	AB	-	1	CH	-	13.76	5.96	5.80	1.12
7A383C0025	3	-	PRO	AB	AB	AB	1	CH	-	14.02	9.18	7.62	1.66
7A383D0838	3A	-	DIS	UT?	AB	-	1	CH	-	17.48	0.00	10.82	2.92
7A383D0240	2	-	PRO	-	AB	AB	1	CH	-	12.62	0.00	0.00	1.20
7A382C0119	2	-	PRO	AB	AB	AB	1	CH	-	16.52	10.10	8.62	3.56
7A383D0126	2	-	MED	AB	AB	-	1	CH	-	21.84	8.08	7.98	2.16
7A382C0254	3	-	PRO	AB	AB	AB	1	CH	-	14.00	9.22	7.94	2.40
7A383D0488	3	-	PRO	RET	RET	AB	2	CH	16:O	43.54	9.30	7.56	3.00
7A383D0150	2	-	DIS	AB	AB	-	2	CH	16:E	31.10	9.48	9.34	2.10
7A382C0396	3A	-	PRO	AB	AB	AB	1	CH	-	26.38	9.22	7.34	3.18
7A382C0379	3	-	MED	AB	AB	-	1	CH	-	15.96	7.66	7.62	1.64
7A382C0353	3A	-	PRO	UT?	AB	AB	2	CH	-	26.78	10.36	10.28	1.84
7A382C0209	2	-	MED	AB	AB	-	2	CH	-	19.30	0.00	9.42	2.10
7A383D0483	3	-	MED	AB	AB	-	1	CH	-	16.92	10.68	10.58	3.80
7A383D1223	2	2	PRO	UT	AB	AB	1	CH	-	16.44	10.84	10.82	2.12
7A383A0044	2	-	PRO	AB	AB	AB	2	CH	-	20.66	9.68	9.58	2.04
7A383D0190	2	-	PRO	AB	AB	AB	1	CH	-	14.08	5.52	5.08	2.02
7A382C0248	2	-	PR0	RET	AB	AB	2	CH	-	27.60	10.84	8.92	3.32
7A383D0808	3A	-	PRO	AB	AB	AB	2	CH	-	35.86	0.00	6.60	3.14
7A383D0632	3	-	PRO	AB	AB	AB	1	CH	-	20.68	10.02	7.62	2.10
7A383D1111	2	-	MED	AB	AB	-	1	CH	-	25.00	9.12	9.10	2.60
7A383A0041	2	-	PRO	AB	AB	AB	1	CH	-	23.34	7.84	7.66	2.76
7A383D0829	3A	-	PRO	AB	AB	AB	1	CH	-	20.70	6.94	5.36	1.72
7A382C0060	2	-	DIS	AB	AB	-	2	CH	-	17.58	0.00	7.70	1.78
7A383C0039	2	-	CO	AB	AB	AB	2	CH	-	36.88	10.70	9.26	3.68
7A383D1222	2	2	PRO	AB	AB	AB	2	CH	-	17.30	7.46	6.94	1.82
7A382C0205	2	-	PRO	AB	AB	AB	1	CH	-	23.46	0.00	8.96	2.30
7A382C0170	2	-	PRO	AB	AB	AB	1	CH	-	22.58	7.42	5.38	2.72
7A383D1208	3	-	MED	AB	AB	-	2	CH	-	12.76	10.82	10.78	2.90
7A382C0459	3	-	PRO	AB	AB	AB	1	CH	-	16.78	9.78	9.52	2.12
7A382C0425	3A	-	DIS	AB	AB	-	2	CH	-	29.28	9.18	9.18	2.02
7A383D0071	2	-	PRO	AB	AB	AB	1	CH	-	21.88	10.90	8.12	2.60
7A382C0216	2	-	MED	AB	AB	-	1	CH	-	9.40	9.86	9.80	2.14
7A382C0336	3A	-	MED	AB	AB	-	2	CH	-	11.84	9.58	9.38	0.96
7A383A0056	2	-	PRO	AB	AB	AB	1	CH	-	11.94	7.74	6.00	1.78
7A382B0037	2	-	PRO	AB	AB	AB	1	CH	-	13.24	0.00	6.42	1.78
7A383D0746	3A	-	MED	AB	AB	-	1	CH	-	15.54	7.26	7.16	1.52
7A382C0057	2	-	DIS	AB	AB	-	1	CH	-	17.56	8.18	7.10	1.66
7A382C0445	2	-	PRO	UT	AB	AB	1	CH	-	27.28	10.36	10.20	1.02
7A382C0097	2	-	MED	AB	AB	-	1	CH	-	20.52	7.38	6.96	1.80

Table 38: Microblade/blade attributes continued

ARTNO	LEV	FEA	SEG	ERA	ERB	HM	# A	RM	PL	L	W1	W2	T
7A383D1017	3	-	MED	AB	AB	-	2	CH	-	22.00	8.62	8.62	2.14
7A382C0123	2	-	PRO	AB	AB	AB	1	CH	-	19.42	7.46	5.80	1.82
7A383D0879	3A	-	MED	AB	UT	-	2	CH	-	19.52	0.00	9.60	1.74
7A383D0571	3A	-	MED	AB	AB	-	1	CH	-	21.30	10.54	9.82	2.48
7A382C0469	3A	-	MED	AB	AB	-	2	CH	-	8.40	6.98	6.98	1.18
7A383D0913	2	-	MED	AB	AB	-	1	CH	-	8.82	0.00	9.64	0.00
7A383D0976	3A	-	PRO	AB	AB	AB	1	CH	-	12.68	10.46	8.92	2.56
7A383D0589	3A	-	PRO	AB	AB	AB	1	CH	-	10.00	6.78	6.68	1.60
7A382C0218	2	-	DIS	AB	AB	-	1	CH	-	11.68	4.90	4.70	1.68
7A383A0029	2	-	DIS	AB	AB	-	1	CH	-	8.42	7.34	7.22	0.86
7A383A0025	2	-	DIS	AB	AB	AB	1	CH	-	8.68	2.92	2.90	0.88
7A383D0181	2	-	MED	AB	AB	-	1	CH	-	8.54	3.86	3.84	1.14
7A383D0921	3	-	PRO	AB	AB	AB	1	CH	-	16.58	8.48	8.40	2.26
7A383A0047	2	-	MED	AB	AB	-	1	CH	-	13.62	6.92	6.64	1.58
7A383A0103	2	-	MED	AB	AB	-	1	CH	-	12.96	9.22	9.16	1.60
7A383D0213	2	-	MED	AB	AB	-	1	CH	-	12.10	8.94	8.94	1.96
7A382C0444	3	-	MED	RET	UT	-	2	CH	-	8.92	0.00	10.00	2.46
7A383D1225	2	-	DIS	AB	AB	-	1	CH	-	14.52	0.00	9.48	2.62
7A382C0470	3A	-	DIS	AB	AB	-	1	CH	-	13.38	5.18	4.00	1.24
7A383D0093	2	-	MED	AB	AB	-	1	CH	-	16.72	9.68	9.06	2.56
7A383D0257	2	-	PRO	AB	AB	AB	1	CH	-	11.78	0.00	5.68	0.00
7A382C0417	3A	-	PRO	AB	AB	AB	1	CH	-	14.72	0.00	8.86	0.00
7A382C0433	3A	-	MED	AB	AB	-	2	CH	-	21.08	7.20	6.96	1.30
7A382C0402	3	-	PRO	AB	UT?	AB	1	RC	16:K	50.44	15.28	10.22	4.28
7A383D0452	3	-	MED	AB	AB	-	2	RC	-	37.42	12.70	0.00	4.42
7A382C0054	2	-	MED	UT	UT	-	2	RC	-	22.56	18.00	17.82	3.20
7A382C0337	3A	-	PRO	AB	AB	AB	2	RC	-	25.56	11.20	10.56	3.44
7A383D0984	3	-	MED	RET	RET	SN	1	RC	-	13.60	17.72	17.70	3.60
7A382C0361	3	-	MED	AB	AB	-	1	RC	-	37.72	12.16	12.12	4.48
7A382C0371	3A	-	MED	RET	RET	-	2	RC	-	12.70	13.36	13.34	3.48
7A382C0136	2	-	MED	AB	AB	-	2	RC	-	10.96	12.36	12.32	2.40
7A383D0410	3	-	MED	AB	AB	-	1	RC	-	19.20	10.38	9.22	3.00
7A382C0042	2	-	MED	AB	AB	-	2	RC	-	14.52	11.34	11.08	2.60
7A382C0282	3	-	PRO	RET	RET	-	2	RC	-	14.80	14.20	14.16	3.84
7A383D0559	3A	-	PRO	AB	AB	-B	1	RC	-	13.72	13.22	12.90	2.20
7A383D1206	2	-	MED	UT	AB	-	2	CH	-	29.62	12.96	11.50	2.20
7A383A0069	2	-	PRO	AB	UT?	AB	1	CH	-	49.32	12.56	10.34	2.46
7A382C0466	3A	-	PRO	RET	RET	ST	2	CH	-	47.24	14.78	14.60	3.84
7A383D0066	2	-	PRO	UT	AB	AB	2	CH	-	48.68	14.00	12.16	3.32
7A382C0070	2	-	MED	AB	AB	-	2	CH	-	29.82	11.78	11.08	2.80
7A383D0500	3	-	PRO	UT	AB	AB	1	CH	-	33.32	12.04	11.18	2.88
7A382C0206	2	-	PRO	UT	UT	AB	2	CH	-	38.20	13.20	10.56	2.08
7A382C0480	3	-	DIS	UT	AB	-	1	CH	-	34.86	13.60	13.54	3.54
7A383D0858	3A	-	MED	UT	UT	-	1	CH	-	43.24	15.12	15.10	4.18
7A383D0566	3A	-	MED	UT	UT	-	1	CH	-	49.80	11.22	10.82	3.70
7A382C0069	2	-	DIS	RET	RET	-	2	CH	-	41.98	0.00	16.84	4.82

Table 38: Microblade/blade attributes continued

ARTNO	LEV	FEA	SEG	ERA	ERB	HM	# A	RM	PL	L	W1	W2	T
7A382C0428	3A	-	CO	AB	AB	AB	1	CH	-	46.26	11.28	9.90	2.76
7A383D0477	3	2	CO	RET	UT	AB	2	CH	16:T	69.80	18.08	14.38	4.54
7A383D0466	3A	-	MED	AB	UT	-	2	CH	-	38.60	12.64	11.04	3.02
7A383D0418	3	-	MED	AB	UT	-	2	CH	-	30.60	12.70	11.68	1.82
7A382C0068	2	-	MED	AB	UT?	-	1	CH	-	40.68	11.96	9.84	3.80
7A382C0503	3A	-	PRO	AB	AB	AB	2	CH	-	37.16	12.08	11.84	2.38
7A382C0452	3A	-	MED	AB	UT	-	2	CH	-	36.84	13.02	12.96	2.84
7A383D0538	3A	-	MED	UT?	AB	-	2	CH	-	35.00	12.60	12.58	2.36
7A383D0655	3A	-	MED	UT	AB	-	1	CH	-	25.98	13.78	13.36	3.14
7A382C0449	3	-	PRO	UT	UT	AB	1	CH	-	45.28	16.38	14.16	3.26
7A382C0035	2	-	CO	AB	AB	AB	1	CH	-	35.70	14.54	9.18	3.34
7A383D0458	3A	-	PRO	AB	UT	AB	2	CH	-	51.08	13.46	13.04	1.90
7A383D0480	3	2	PRO	UT	AB	AB	1	CH	-	35.26	12.40	10.24	2.72
7A383D0175	2	-	PRO	UT?	UT	AB	1	CH	-	27.44	11.86	9.60	2.76
7A382C0143	2	-	DIS	UT?	AB	-	2	CH	-	35.20	11.82	11.74	3.20
7A382C0381	3A	8	DIS	UT	UT	-	2	CH	-	32.74	13.08	13.04	2.94
7A383D0515	3	-	PRO	UT	-	AB	2	CH	-	43.14	0.00	0.00	3.68
7A383D1110	2	-	PRO	AB	AB	AB	1	CH	-	41.08	18.96	18.88	6.98
7A382C0291	3	-	MED	AB	UT	-	3	CH	-	33.64	13.82	13.50	3.52
7A383D0244	2	-	PRO	RET	AB	AB	2	CH	-	34.66	12.50	12.04	2.74
7A382C0319	3A	-	PRO	RET	UT?	AB	1	CH	-	22.32	0.00	7.96	0.00
7A383D0819	3A	-	DIS	RET	UT	-	1	CH	-	26.00	0.00	12.74	0.00
7A383C0118	4	-	PRO	AB	AB	AB	1	CH	-	15.62	0.00	10.62	0.00
7A383D0221	2	-	MED	AB	AB	-	1	CH	-	30.00	11.52	11.18	3.44
7A382B0059	2	-	MED	AB	AB	-	1	CH	-	29.62	15.26	13.38	3.78
7A383D1278	3L	-	DIS	AB	UT	-	3	CH	-	20.42	0.00	13.56	0.00
7A382C0242	2	-	PRO	AB	AB	-	1	CH	16:S	37.22	19.42	16.48	3.24
7A383D0195	2	-	PRO	AB	AB	AB	1	CH	-	35.48	0.00	13.14	0.00
7A383D0096	2	-	PRO	AB	AB	-	2	CH	-	23.98	12.64	11.76	1.60
7A383D0187	2	-	PRO	AB	AB	AB	1	CH	-	20.66	11.02	10.00	1.84
7A382C0274	3	-	PRO	UT	UT	AB	2	CH	-	40.98	0.00	11.08	3.48
7A383D0194	2	-	PRO	UT	UT	AB	1	CH	-	31.10	12.22	10.44	3.54
7A383D0690	3A	-	PRO	UT	UT	AB	1	CH	-	37.88	17.08	11.58	3.36
7A382C0412	3	-	PRO	RET	RET	AB	2	CH	-	33.46	16.94	16.92	3.74
7A383C0073	2	-	PRO	UT	AB	AB	1	CH	-	21.08	11.48	10.52	1.88
7A383D0119	2	-	DIS	UT	AB	-	1	CH	-	23.72	11.30	11.28	2.10
7A382C0052	2	-	PRO	RET	RET	AB	1	CH	-	32.36	12.64	12.16	3.79
7A383D0583	3A	-	PRO	AB	AB	AB	1	CH	-	30.92	10.82	10.04	3.12
7A382C0343	3	-	PRO	AB	AB	AB	1	CH	-	25.00	10.60	10.56	2.06
7A382C0299	3	-	MED	UT?	AB	SN	2	CH	16:I	29.56	11.92	11.62	2.00
7A382C0391	3A	-	PRO	AB	AB	AB	1	CH	-	16.66	12.62	12.58	2.22
7A382C0030	1	-	PRO	-	-	ST	1	CH	-	19.22	0.00	16.94	5.00
7A383D0082	2	2A	MED	UT	AB	-	2	CH	-	15.30	14.12	14.00	3.14
7A383D0529	3A	-	DIS	AB	AB	-	1	CH	-	22.54	12.22	11.80	2.16
7A383D0350	3	-	MED	AB	AB	-	1	CH	-	22.56	11.98	9.82	2.46
7A383D0695	3A	-	PRO	AB	AB	AB	2	CH	-	15.44	12.16	11.98	3.30

Table 38: Microblade/blade attributes continued

ARTNO	LEV	FEA	SEG	ERA	ERB	HM	# A	RM	PL	L	W1	W2	T
7A383D0427	3	-	PRO	AB	AB	AB	1	CH	-	14.56	10.42	10.42	2.06
7A383D0162	2	-	PRO	AB	AB	AB	1	CH	-	21.68	13.48	11.92	3.20
7A382C0067	2	-	PRO	AB	AB	AB	1	CH	-	30.92	0.00	7.74	2.48
7A382C0200	2	-	CO	AB	AB	AB	1	CH	-	25.08	15.18	10.48	3.22
7A382C0037	2	-	DIS	AB	AB	-	1	CH	-	22.94	11.72	11.38	4.60
7A382C0385	3	-	PRO	AB	UT?	AB	1	CH	-	20.22	13.52	13.46	3.52
7A383D1224	2	2	MED	AB	UT	-	1	CH	-	20.50	0.00	12.00	1.64
7A383C0040	2	-	PRO	AB	AB	AB	1	CH	-	19.28	12.50	11.98	2.52
7A382C0045	2	-	PRO	AB	AB	AB	2	CH	-	13.38	0.00	9.80	1.08
7A383D0736	3A	-	PRO	AB	AB	AB	2	CH	-	16.32	11.28	11.08	2.02
7A382C0256	3	-	PRO	AB	AB	AB	1	CH	-	18.74	0.00	10.34	3.16
7A383D1066	3A	-	DIS	-	-	SN	1	CH	16:J	18.64	12.36	12.30	3.62
7A382C0410	3	-	PRO	AB	AB	AB	2	CH	-	20.98	0.00	14.72	1.88
7A382C0142	2	-	PRO	AB	AB	AB	1	CH	-	18.14	11.26	11.10	1.82
7A382C0306	3	-	PRO	AB	UT?	AB	1	CH	-	25.64	13.34	12.60	2.34
7A383D0965	2	-	MED	AB	AB	-	2	CH	-	16.24	0.00	13.94	2.48
7A383D0275	2	-	MED	AB	AB	-	2	CH	-	12.48	11.86	11.86	3.04
7A382C0103	2	-	DIS	AB	AB	-	2	CH	-	20.78	13.68	13.68	2.30
7A382C0490	3A	-	PRO	UT?	UT?	AB	0	CH	-	20.00	12.34	12.32	2.44
7A383D1039	3A	-	MED	AB	AB	-	3	CH	-	29.08	12.98	12.82	2.00
7A383D0738	3A	9	DIS	AB	AB	-	1	CH	-	48.86	11.84	11.60	4.76
7A383D0832	3A	-	PRO	UT	UT?	AB	2	CH	-	31.00	11.10	10.12	1.96
7A383D0551	3A	-	DIS	UT	UT	-	2	CH	-	34.22	12.90	10.92	3.44
7A383D0735	3A	9	MED	AB	AB	ST	2	CH	-	44.34	12.68	11.44	3.40
7A383D0857	3A	9	PRO	AB	AB	AB	1	CH	-	33.04	11.86	11.64	2.46
7A382C0356	3A	-	PRO	AB	UT?	AB	2	CH	-	39.56	15.60	14.12	5.34
7A383D0700	3A	-	PRO	AB	AB	AB	2	CH	-	25.08	0.00	16.18	2.44
7A383D0070	2	-	PRO	AB	AB	AB	2	CH	-	27.22	14.18	13.66	2.60
7A383D1030	3U	-	PRO	AB	AB	AB	2	CH	-	40.52	14.36	14.12	4.32
7A383D1096	2	-	MED	AB	UT	-	1	CH	-	43.46	12.12	12.00	3.74
7A383D0757	3A	-	PRO	AB	AB	AB	2	CH	-	31.58	16.66	15.70	4.82
7A383D0674	3A	-	DIS	AB	UT	-	1	CH	-	27.62	13.14	13.14	2.86
7A383D1038	3A	-	PRO	AB	UT?	AB	2	CH	-	20.50	11.56	11.50	1.96
7A383D0658	3A	-	PRO	AB	UT	AB	1	CH	-	32.48	12.84	12.62	3.42
7A383D0414	3	-	MED	AB	AB	-	2	CH	-	30.70	14.32	12.64	1.86
7A383D0749	3A	-	PRO	AB	AB	AB	1	CH	-	29.84	15.54	15.46	3.00
7A383D0753	3A	-	DIS	AB	AB	-	2	CH	-	25.68	13.34	13.34	2.88
7A383D0476	3	-	DIS	AB	AB	-	2	CH	-	31.08	13.40	12.96	3.48
7A383D0530	3A	-	PRO	UT	UT	AB	2	CH	-	28.82	12.66	12.48	2.04
7A383A0032	2	-	MED	AB	AB	-	1	CH	-	28.54	12.00	9.06	2.46
7A383D0278	2	-	PRO	AB	AB	AB	2	CH	-	22.96	14.52	14.32	2.34
7A383D0670	3A	-	PRO	AB	AB	AB	2	CH	-	20.42	11.18	9.36	1.70
7A383D0943	2	-	CO	UT	UT	ST	1	CH	16:R	39.62	12.40	11.98	2.56
7A383D0759	3A	-	MED	AB	AB	-	2	CH	-	22.06	13.44	13.42	2.68
7A383D0081	2	-	PRO	AB	AB	AB	1	CH	-	22.32	11.92	11.84	3.08
7A383D1019	3	2A	PRO	UT	UT	AB	2	CH	-	36.46	12.46	12.44	2.46

Table 38: Microblade/blade attributes continued

ARTNO	LEV	FEA	SEG	ERA	ERB	HM	# A	RM	PL	L	W1	W2	T
7A383D0219	2	-	DIS	UT	UT	-	2	CH	-	32.18	13.52	13.44	3.54
7A383D0645	3	-	MED	UT	UT	-	3	CH	-	26.38	19.58	18.72	4.34
7A383D0569	3A	-	CO	UT	UT	AB	2	CH	-	43.12	18.56	17.32	4.58
7A383A0108	2	-	PRO	AB	UT	AB	2	CH	-	35.92	14.08	14.02	2.68
7A383D1020	3U	-	PRO	AB	AB	AB	2	CH	-	28.00	13.74	13.67	2.70
7A383D0675	3A	-	PRO	AB	AB	AB	2	CH	-	25.98	19.20	19.12	3.12
7A382C0483	3A	-	CO	AB	AB	AB	2	CH	-	49.62	14.10	9.74	4.56
7A383D0936	2	-	PRO	AB	AB	AB	2	CH	-	19.82	11.58	11.48	2.32
7A383D0503	3	2A	MED	AB	AB	-	2	CH	-	17.86	11.58	11.52	1.64
7A383D0767	3A	-	PRO	AB	AB	AB	2	CH	-	19.80	15.08	11.32	3.68
7A383D1076	3A	-	PRO	AB	AB	AB	2	CH	-	17.86	0.00	12.08	3.16
7A383D1029	3	-	PRO	AB	AB	AB	2	CH	-	28.12	13.54	12.18	2.90
7A383D0901	2	2	MED	UT	UT	-	2	CH	-	23.22	12.88	12.82	2.16
7A383D0158	2	2	DIS	AB	UT	-	2	CH	-	17.00	0.00	16.62	1.84
7A383A0086	3	-	PRO	UT	AB	AB	2	CH	-	24.00	12.36	12.28	2.30
7A383D0904	2	2	MED	AB	AB	-	1	CH	-	19.78	12.50	11.08	2.52
7A383D0843	3A	-	CO	AB	AB	SN	2	CH	16:Q	37.48	14.00	13.94	4.02
7A382C0223	2	-	PRO	-	AB	AB	1	CH	-	24.32	0.00	12.68	2.26
7A383D1044	3	-	PRO	UT	AB	AB	2	CH	-	21.82	13.60	11.02	2.00
7A383D0358	3	-	MED	AB	UT	-	3	CH	-	10.68	0.00	13.52	3.00
7A383D0966	2	-	PRO	AB	AB	AB	1	CH	-	25.92	13.44	11.58	3.20
7A383D0716	3A	-	PRO	AB	AB	AB	2	CH	-	20.18	13.38	12.86	1.88
7A383D0684	3A	-	MED	UT	AB	-	2	CH	-	32.22	16.42	15.04	4.02
7A383D0143	2	-	PRO	AB	AB	AB	1	CH	-	22.08	14.10	10.64	2.36
7A382C0464	3A	-	PRO	AB	AB	AB	2	CH	-	18.10	11.24	10.46	2.88
7A383D0145	2	-	PRO	AB	AB	AB	1	CH	-	15.50	12.76	11.94	2.68
7A383D0327	2	-	CO	AB	UT	ST	1	CH	16:P	43.36	19.40	16.84	3.74
7A383D0740	3A	9	PRO	AB	AB	AB	1	CH	-	21.92	13.10	10.96	2.18
7A383D1021	3U	-	DIS	AB	UT	-	2	CH	-	50.20	15.76	14.28	8.26
7A383D1202	2	-	PRO	UT	UT	AB	1	CH	-	32.12	0.00	12.32	0.00
7A382B0028	2	-	MED	AB	AB	-	1	CH	-	9.32	0.00	16.58	2.64
7A383D0956	2	-	PRO	AB	AB	AB	2	CH	-	24.02	12.66	12.04	3.38
7A383D1010	3	-	MED	AB	AB	-	3	CH	-	24.02	0.00	22.20	2.84
7A383D1016	3	-	PRO	AB	AB	AB	1	CH	-	14.52	12.08	11.96	2.34
7A383D0146	2	-	DIS	AB	AB	-	2	CH	-	10.18	13.58	12.42	3.96
7A383C0038	2	-	MED	AB	AB	-	1	CH	-	26.46	13.08	12.78	4.52
7A383D0217	2	-	DIS	AB	AB	-	2	CH	-	24.66	11.40	11.28	5.08
7A383D0157	2	2	PRO	AB	AB	AB	2	CH	-	14.92	11.26	10.22	3.24
7A383D0495	3	2A	DIS	AB	AB	-	3	CH	-	21.68	12.80	12.72	2.20
7A383D0662	3A	-	PRO	UT	AB	AB	1	CH	-	18.72	0.00	8.48	2.00
7A383D0250	2	-	PRO	AB	AB	AB	2	CH	-	18.94	14.90	12.84	3.34
7A383D1060	3A	-	MED	AB	AB	-	3	CH	-	12.22	0.00	12.28	2.16
7A383D0351	3	-	DIS	AB	AB	-	1	CH	-	22.28	12.60	12.04	2.36
7A383D0598	3A	-	MED	AB	AB	-	1	CH	-	39.74	14.64	13.78	5.76
7A382C0332	3A	-	PRO	AB	AB	AB	1	CH	-	34.28	11.44	8.88	6.00
7A383C0066	2	-	PRO	UT	RET	-	1	CH	-	12.18	0.00	16.08	3.08

Table 38: Microblade/blade attributes continued

ARTNO	LEV	FEA	SEG	ERA	ERB	HM	# A	RM	PL	L	W1	W2	T
7A383D0498	3	-	PRO	UT	UT	AB	1	CH	-	29.74	13.76	12.80	3.42
7A383D1241	2	2	PRO	AB	AB	AB	2	CH	-	16.10	0.00	16.08	4.12
7A383D0155	2	2	PRO	-	AB	AB	1	CH	-	29.76	0.00	0.00	0.00
7A383D0756	3A	-	PRO	AB	UT	AB	2	CH	-	18.38	16.52	16.48	3.00
7A383D0535	3A	-	PRO	AB	AB	AB	2	CH	-	24.08	0.00	17.82	3.70
7A383D0507	3	-	PRO	UT	UT	AB	1	CH	-	23.82	0.00	15.02	3.24
7A382C0473	3	-	PRO	AB	AB	AB	2	CH	-	28.06	11.68	10.02	2.30
7A382C0104	2	-	MED	AB	AB	-	1	CH	-	24.18	11.38	11.30	2.48
7A382C0457	3A	-	MED	UT	UT	-	1	CH	-	28.14	14.34	14.12	2.58
7A382C0455	3A	-	MED	AB	UT	-	2	CH	-	41.38	34.88	34.36	7.74
7A383D0991	3A	-	PRO	UT	UT	AB	1	CH	-	44.48	34.52	34.48	11.48
7A383D1302	3	-	CO	AB	AB	AB	1	CH	-	9.06	3.00	2.84	0.96
7A382C0416	3A	-	DIS	AB	AB	-	1	CH	-	9.26	4.90	4.42	0.96
7A382B0026	2	-	PRO	AB	AB	AB	1	RC	-	15.76	10.98	10.96	2.92
7A382B0038	2	-	DIS	AB	AB	-	2	RC	-	20.94	8.52	8.50	1.78
7A383D0661	3A	-	PRO	AB	AB	AB	1	CH	-	21.16	10.00	9.26	2.16
7A383D0257	2	-	PRO	AB	AB	AB	1	CH	-	24.52	9.32	7.80	1.44
7A383D0395	3	-	PRO	AB	AB	AB	1	CH	-	12.00	8.32	6.62	1.70
7A383D0234	2	-	DIS	AB	AB	-	1	CH	-	6.62	2.24	2.22	0.64
7A383D0404	3A	-	DIS	AB	AB	-	1	CH	-	17.78	4.76	4.68	1.04
7A383D0212	2	-	CO	AB	AB	AB	1	CH	-	9.66	4.22	4.14	0.86
7A383D0189	2	-	PRO	AB	AB	AB	2	CH	-	7.96	5.44	4.76	0.92
7A383D0236	2	2A	PRO	AB	AB	AB	1	CH	-	7.86	6.34	6.12	1.42
7A382B0054	2	-	MED	AB	AB	-	1	CH	-	5.12	7.66	7.66	1.16
7A383A0054	2	-	DIS	AB	AB	-	2	CH	-	6.08	5.62	5.48	1.16
7A383A0037	2	-	PRO	AB	AB	AB	1	CH	-	7.96	5.76	5.50	1.20
7A383D0101	2	-	PRO	UT?	UT?	AB	1	CH	-	15.24	8.32	8.14	1.36
7A382C0305	3	-	PRO	AB	AB	AB	1	CH	-	18.84	0.00	7.00	1.98
7A382C0061	2	-	PRO	AB	AB	AB	1	CH	-	22.26	4.80	4.52	1.76
7A383A0035	2	-	PRO	AB	AB	AB	1	CH	-	12.92	10.38	7.26	1.50
7A383D0754	3A	-	MED	AB	AB	-	1	RC	-	9.60	10.48	9.74	3.08
7A383D0339	3	-	MED	UT	-	-	2	CH	-	10.04	9.62	0.00	2.42
7A382C0204	2	-	CO	AB	AB	AB	1	CH	-	14.10	5.42	5.12	1.46
7A382C0373	3	-	CO	AB	AB	AB	1	CH	-	21.38	9.10	8.56	2.33
7A383D0988	3U	-	PRO	AB	AB	AB	1	CH	-	13.80	7.68	7.26	1.50
7A383D0710	3L	-	PRO	-	AB	AB	2	CH	-	17.06	10.46	10.38	2.16
7A382C0194	2	-	DIS	AB	AB	-	1	CH	-	16.88	0.00	5.54	0.00
7A383D0083	2	-	PRO	AB	-	AB	1	CH	-	15.64	8.44	0.00	1.78
7A383D0478	3	2	PRO	AB	AB	AB	2	CH	-	15.68	11.08	9.54	2.66
7A383D0383	3	-	PRO	AB	AB	AB	2	CH	-	19.48	0.00	6.38	0.96
7A383D0050	2	-	MED	AB	AB	-	2	CH	-	10.68	0.00	11.38	1.32
7A383D0479	3	2	PRO	AB	AB	AB	1	CH	-	13.54	7.52	7.18	1.60
7A383D0969	2	-	MED	AB	AB	-	2	CH	-	5.80	0.00	10.88	1.00
7A382C0139	2	-	MED	-	-	-	1	CH	-	14.32	9.82	0.00	1.60
7A383D0911	2	2A	PRO	UT	AB	-	3	CH	-	10.08	8.54	8.34	1.32
7A383D0681	3A	-	PRO	AB	AB	AB	1	CH	-	13.60	5.50	4.62	1.66

Table 38: Microblade/blade attributes continued

ARTNO	LEV	FEA	SEG	ERA	ERB	HM	# A	RM	PL	L	W1	W2	T
7A382C0462	3A	-	PRO	AB	UT	AB	1	CH	-	20.42	7.56	6.28	1.18
7A383D0228	2	-	PRO	UT	AB	AB	1	CH	-	14.50	7.32	6.56	1.78
7A383D0030	2	-	MED	-	-	-	1	CH	-	8.06	0.00	0.00	1.72
7A383D1073	3A	-	CO	UT	AB	AB	2	CH	-	17.36	7.44	7.24	2.12
7A382C0217	2	-	MED	UT	UT	-	2	CH	-	7.56	8.44	8.24	2.16
7A382C0071	2	-	PRO	AB	AB	AB	1	CH	-	17.58	9.32	9.08	1.94
7A383C0050	2	-	PRO	AB	AB	AB	2	CH	-	15.18	7.48	7.48	2.52
7A382B0032	2	-	DIS	AB	AB	-	1	CH	-	10.70	8.96	8.94	2.20
7A383D0091	2	-	PRO	-	AB	AB	1	CH	-	15.78	10.10	9.08	1.90
7A383D0248	2	-	PRO	AB	AB	AB	1	CH	-	25.90	10.90	7.94	2.36
7A383D0214	2	-	PRO	AB	AB	AB	1	CH	-	16.68	8.54	5.98	1.26
7A383D0177	2	-	DIS	AB	AB	-	2	CH	-	10.94	8.48	8.34	1.34
7A383A0053	2	-	PRO	AB	-	AB	1	CH	-	14.00	7.00	0.00	2.02
7A383A0020	2	-	PRO	AB	AB	AB	1	CH	-	12.06	6.34	6.34	1.28
7A382C0429	3A	-	PRO	-	AB	AB	1	CH	-	18.50	0.00	0.00	2.30
7A383D0590	3U	-	PRO	AB	AB	AB	1	CH	-	15.28	9.02	8.08	1.98
7A383D0580	3A	-	PRO	AB	AB	AB	1	CH	-	19.90	9.52	8.88	2.12
7A383D0353	3	-	MED	AB	UT	-	1	CH	-	8.64	6.06	5.56	0.98
7A382C0235	2	-	CO	AB	RET	ST	2	CH	-	29.72	10.68	10.38	4.86
7A383D0394	3	-	PRO	AB	AB	AB	1	CH	-	12.14	8.60	8.56	1.78
7A382B0050	2	-	PRO	AB	AB	AB	1	CH	-	11.84	8.84	8.32	1.32
7A383D0118	2	-	DIS	AB	AB	-	1	CH	-	15.32	10.98	9.88	2.76
7A382C0122	2	-	DIS	AB	AB	-	2	CH	-	7.72	5.80	5.56	1.12
7A383D0305	2	5	PRO	-	AB	AB	1	CH	-	24.38	9.78	7.36	2.12
7A383C0068	2	-	PRO	AB	AB	AB	1	CH	-	11.68	6.74	6.58	1.46
7A383D0508	3	-	PRO	AB	AB	AB	1	CH	-	24.86	10.70	9.34	2.66
7A382B0046	2	-	PRO	AB	AB	AB	1	CH	-	22.54	10.50	10.28	2.46
7A383D0981	3	-	PRO	-	-	-	1	CH	-	23.42	0.00	0.00	2.26
7A383D0149	2	-	PRO	AB	AB	AB	1	CH	-	11.18	7.56	7.52	1.78
7A383D1065	3A	-	PRO	AB	AB	AB	2	CH	-	13.46	9.08	7.54	1.82
7A383D0352	3	-	PRO	AB	UT	AB	1	CH	-	11.94	10.06	9.78	1.64
7A382C0034	2	-	PRO	UT	UT	SN	1	CH	-	18.42	9.64	7.28	2.06
7A383D0154	2	2	PRO	AB	AB	AB	1	CH	-	15.66	7.92	7.14	2.18
7A383A0052	2	-	PRO	AB	AB	AB	1	CH	-	10.54	9.42	9.38	2.36
7A383D0780	3	-	PRO	AB	AB	AB	1	CH	-	9.36	8.10	7.64	1.40
7A383D0198	2	-	PRO	AB	AB	AB	1	CH	-	16.68	9.80	5.98	3.22
7A383D0238	2	-	PRO	AB	AB	AB	1	CH	-	13.60	13.70	8.86	1.60
7A382B0031	2	-	PRO	AB	AB	AB	1	CH	-	18.94	10.64	10.38	1.50
7A383D0161	2	-	PRO	AB	AB	AB	2	CH	-	11.68	8.18	8.16	1.14
7A382C0168	2	-	DIS	AB	AB	-	1	CH	-	9.22	0.00	7.64	0.00
7A383D0922	3	-	PRO	AB	AB	AB	1	CH	-	9.30	8.34	7.74	1.56
7A382B0034	2	-	PRO	UT	UT	AB	1	CH	-	12.78	9.54	9.50	1.66
7A383D1037	3A	-	PRO	AB	-	AB	1	CH	-	24.58	0.00	0.00	2.74
7A383D0260	2	2	MED	AB	AB	-	1	CHA	-	20.40	10.84	9.50	2.66
7A382B0029	2	-	PRO	AB	AB	AB	1	CH	-	11.60	6.14	6.04	0.96
7A383D0964	2	-	PRO	AB	AB	AB	1	CH	-	13.54	10.72	9.70	1.58

Table 38: Microblade/blade attributes continued

ARTNO	LEV	FEA	SEG	ERA	ERB	HM	# A	RM	PL	L	W1	W2	T
7A383D0300	2	-	PRO	AB	AB	AB	1	CH	-	9.68	9.34	8.32	1.22
7A382C0155	2	-	PRO	AB	AB	AB	1	CH	-	14.22	9.22	8.12	1.90
7A382B0030	2	-	CO	AB	AB	AB	1	CH	-	17.96	8.44	8.44	1.88
7A383D0663	3A	-	CO	AB	AB	AB	2	CH	-	33.04	8.64	8.64	2.92
7A382C0085	2	-	MED	AB	AB	-	1	CH	-	13.02	8.38	7.22	1.46
7A382C0109	2	-	PRO	UT	AB	AB	2	CH	-	12.56	9.52	9.52	1.12
7A382C0052	2	-	PRO	AB	-	AB	1	CH	-	21.34	11.18	9.22	2.00
7A383D1353	3A	9	MED	AB	AB	-	1	CH	-	18.56	0.00	0.00	1.36
7A383D1344	3U	-	PRO	AB	AB	AB	1	CH	-	36.56	0.00	13.48	4.86
7A382C0011	2	-	PRO	RET	UT	AB	1	CH	-	58.58	17.46	14.46	4.52
7A382B0005	2	-	CO	UT	AB	AB	1	CH	-	59.66	13.10	11.48	4.58
7A382B0001	2	-	MED	UT	UT	-	2	CH	-	38.74	0.00	18.00	3.94
7A382B0016	2	-	PRO	UT	AB	AB	1	CH	-	44.22	19.34	12.72	3.54
7A382B0006	2	-	DIS	UT	AB	-	2	CH	-	39.72	14.48	13.52	3.04
7A383A0003	2	-	DIS	AB	UT?	-	2	CH	-	33.46	13.74	13.74	2.28
7A382C0007	2	-	MED	UT	UT	-	3	CH	-	21.42	17.44	17.44	2.28
7A383D0027	2	-	PRO	UT	UT	AB	1	CH	-	30.86	12.28	12.28	2.46
7A383D0018	2	-	MED	RET	UT	-	2	CH	-	35.80	10.72	9.28	3.34
7A383D0023	2	-	PRO	UT	UT	AB	1	CH	-	33.38	10.62	9.14	2.92
7A382B0012	2	-	MED	AB	AB	-	1	CH	-	21.38	14.16	12.16	3.82
7A383D0003	2	-	PRO	AB	AB	AB	2	CH	-	27.96	12.38	12.36	2.56
7A383A0004	2	-	DIS	AB	AB	-	1	CH	-	30.26	11.78	11.78	3.04
7A382B0008	2	-	PRO	AB	AB	AB	1	CH	-	20.20	12.76	11.68	3.26
7A383D0021	2	-	MED	UT	AB	-	2	CH	-	21.14	13.88	12.72	3.54
7A383D0020	2	-	MED	AB	AB	-	2	CH	-	15.46	14.84	14.84	3.36
7A382C0016	2	-	CO	UT	RET	SN	1	CH	-	24.68	12.66	11.28	3.14
7A382C0020	2	-	PRO	AB	AB	AB	1	CH	-	20.52	12.00	11.32	1.38
7A382C0002	2	-	MED	UT	UT	-	2	CH	-	26.94	10.78	10.78	2.16
7A382C0001	2	-	DIS	AB	AB	-	2	CH	-	28.18	0.00	9.28	1.56
7A382B0015	2	-	PRO	AB	AB	AB	1	RC	-	26.84	9.52	8.10	2.46
7A382B0009	2	-	DIS	RET	UT	-	2	CH	-	18.36	10.64	10.64	2.18
7A382B0007	2	-	MED	UT	UT	-	1	CH	-	17.58	10.32	10.32	2.40
7A382B0014	2	-	CO	AB	AB	AB	2	CH	-	41.84	7.76	7.58	1.38
7A383D0017	2	-	PRO	AB	AB	AB	1	CH	-	37.00	11.20	7.48	2.86
7A383D0009	2	-	DIS	AB	AB	-	2	CH	-	28.22	9.52	9.52	2.06
7A382C0001	2	-	DIS	AB	UT	-	2	CH	-	25.82	9.00	9.00	2.62
7A383A0001	2	-	DIS	AB	AB	-	2	CH	-	19.98	10.20	10.20	2.30
7A383A0005	2	-	MED	AB	AB	-	2	CH	-	20.20	9.56	9.56	2.56
7A382B0011	2	-	PRO	AB	AB	-	1	CH	-	18.92	8.44	8.16	2.26
7A382C0001	2	-	CO	AB	AB	-	1	CH	-	19.16	7.56	7.56	1.80
7A382C0009	2	-	PRO	AB	AB	-	1	CH	-	15.60	10.48	9.08	1.74
7A382C0001	2	-	MED	-	AB	-	1	CH	-	14.42	0.00	0.00	1.96
7A383D0001	2	-	PRO	AB	UT	-	1	CH	-	15.92	10.54	9.22	1.90
7A383D0019	2	-	PRO	AB	AB	-	1	RC	-	14.42	13.34	13.32	2.08
7A383A0009	2	-	CO	UT	RET	AB	1	CH	-	20.06	6.34	4.88	1.38
7A383D0012	2	-	MED	AB	AB	-	1	CH	-	15.34	0.00	3.86	1.22

Table 38: Microblade/blade attributes continued

ARTNO	LEV	FEA	SEG	ERA	ERB	HM	# A	RM	PL	L	W1	W2	T
7A383D0031	3	-	PRO	AB	AB	AB	1	CH	-	19.06	0.00	7.00	1.54
7A383A0010	2	-	MED	AB	AB	-	2	CH	-	14.52	0.00	9.78	1.28
7A382B0001	2	-	DIS	AB	AB	-	1	CH	-	10.92	0.00	5.64	1.08
7A382B0001	2	-	PRO	AB	AB	AB	1	CH	-	13.50	0.00	8.02	1.54
7A382C0001	2	-	MED	AB	AB	-	1	CH	-	19.64	0.00	0.00	1.52
7A382C0001	2	-	PRO	AB	AB	AB	2	CH	-	17.54	0.00	12.92	3.02
7A382C0516	3A	-	PRO	AB	AB	AB	1	CH	-	16.56	7.32	7.28	1.58
7A383D1349	3	-	PRO	AB	AB	AB	1	CH	-	41.28	17.00	16.94	4.38
7A383D1350	3	-	DIS	UT	AB	-	1	CH	-	19.04	0.00	10.16	2.30
7A383D1345	3	-	PRO	AB	AB	AB	1	CH	-	21.58	8.22	6.82	1.90
7A383D1348	3	-	PRO	AB	UT	AB	1	CH	-	18.00	8.76	8.76	2.20
7A383A0109	2	-	PRO	AB	AB	AB	1	CH	-	16.38	10.54	8.34	2.36
7A383C0121	3	-	PRO	AB	AB	AB	1	CH	-	14.66	9.28	9.25	1.74
7A383C0120	-	-	PRO	AB	AB	AB	1	CH	-	15.02	9.26	9.26	1.56
7A383D1315	2	-	PRO	UT	UT	AB	1	CH	-	13.72	7.44	7.44	2.08
7A383D1317	2	-	PRO	AB	AB	AB	1	CH	-	12.68	0.00	7.76	1.52
7A383D1328	3A	-	PRO	AB	AB	AB	2	RC	-	17.88	9.24	9.24	3.46
7A383D1329	3A	-	DIS	AB	AB	-	1	CH	-	13.52	0.00	6.26	1.18
7A383D1331	3A	-	PRO	AB	UT	AB	1	CH	-	20.08	0.00	12.66	3.48
7A383D1332	3A	-	DIS	AB	AB	-	1	CH	-	23.32	0.00	8.82	3.42
7A383D1334	3A	-	MED	AB	AB	-	1	CH	-	18.58	0.00	3.96	1.18
7A383D1335	3A	-	DIS	AB	AB	-	1	CH	-	12.86	0.00	8.46	1.64
7A383D1336	3A	-	DIS	AB	AB	-	2	CH	-	13.04	0.00	5.04	1.04
7A383D1337	3A	-	CO	AB	AB	AB	1	CH	-	27.56	8.38	8.38	1.66
7A383D1340	3U	-	CO	AB	AB	AB	1	CH	-	13.84	4.54	4.54	0.76
7A383D1339	3U	-	MED	AB	AB	-	2	CH	-	17.46	0.00	13.36	1.46
7A383D1341	3U	-	PRO	AB	AB	AB	1	CH	-	15.52	0.00	6.08	1.68
7A383D1342	3U	-	MED	AB	AB	AB	2	CH	-	14.00	0.00	6.22	1.98
7A382C0515	3A	-	PRO	AB	AB	AB	1	CH	-	19.64	0.00	10.72	3.46
7A383D1343	3U	-	PRO	AB	AB	AB	1	CH	-	35.00	16.16	16.16	4.54
7A383D0892	3A	-	PRO	AB	AB	AB	1	CH	-	19.48	0.00	13.44	2.80
7A382C0141	2	-	MED	AB	AB	AB	1	CH	-	19.58	0.00	9.50	2.30
7A383D0441	3A	-	DIS	RET	RET	-	2	CH	-	19.50	0.00	9.88	2.50
7A383C0105	2	-	DIS	RET	RET	-	2	CH	-	24.46	0.00	14.76	3.42
7A383D1076	3A	-	PRO	AB	AB	AB	1	CH	-	27.12	0.00	10.92	3.42
7A383A0023	2	-	DIS	AB	AB	-	3	CH	-	8.78	0.00	10.12	1.74
7A382B0035	2	-	PRO	AB	-	AB	1	CH	-	25.72	10.38	10.38	3.70
7A382C0518	3A	-	PRO	AB	AB	AB	1	CH	-	14.13	0.00	8.98	1.74
7A383D1355	3U	-	PRO	UT	AB	AB	1	CH	-	28.80	14.06	8.00	2.78
7A383D1358	3L	-	CO	AB	AB	AB	2	CH	-	31.78	10.00	9.02	2.72
7A383C0127	2	-	PRO	AB	AB	AB	2	CH	-	8.34	0.00	5.42	1.04
7A383D1363	3A	-	CO	AB	AB	AB	1	CH	-	15.54	5.76	4.16	1.82
7A383D1366	3A	10	MED	AB	AB	-	1	CH	-	19.86	0.00	10.88	1.18
7A383D1365	3A	-	IDS	AB	UT?	-	2	CH	-	18.12	0.00	6.64	2.42
7A383D1364	3A	-	POR	AB	AB	AB	1	RC	-	15.76	0.00	9.56	2.28
7A383D1360	3L	-	MED	AB	AB	-	1	CH	-	10.00	0.00	5.00	0.64

Table 38: Microblade/blade attributes continued

ARTNO	LEV	FEA	SEG	ERA	ERB	HM	# A	RM	PL	L	W1	W2	T
7A383D1362	3L	-	PRO	-	AB	AB	1	CH	-	44.78	0.00	0.00	3.02
7A383D1367	3A	-	CO	AB	AB	AB	1	CH	-	20.38	3.66	3.66	1.48
7A383D1370	3	-	PRO	AB	AB	AB	1	CH	-	18.54	0.00	6.12	1.96
7A383D1372	2	-	PRO	AB	AB	AB	1	CH	-	18.08	0.00	7.00	1.68
7A383D1376	3U	-	CO	AB	AB	AB	1	CH	-	28.74	10.74	10.50	2.64
7A383D1368	3L	-	MED	AB	AB	-	1	CH	-	13.90	0.00	6.00	1.00
7A382C0520	3A	-	POR	AB	AB	AB	3	CH	-	12.44	0.00	9.60	2.72
7A383D1385	2	-	MED	AB	AB	-	1	CH	-	14.38	0.00	8.60	2.48
7A382C0524	3A	8	PRO	AB	AB	AB	2	CH	-	34.46	0.00	11.18	2.58
7A382C0525	3	-	MED	AB	AB	-	1	CH	-	13.38	0.00	8.20	2.06
7A382C0529	3A	-	MED	RET	RET	-	2	CH	-	14.30	0.00	7.16	1.56
7A382C0528	3	-	MED	AB	AB	-	2	CH	-	16.38	0.00	8.48	2.18
7A382C0521	3A	-	PRO	AB	AB	AB	1	CH	-	10.88	0.00	8.00	1.84
7A382C0526	3	-	PRO	AB	AB	AB	1	CH	-	33.72	0.00	7.12	2.38
7A382C0532	3A	-	CO	UT	UT	AB	1	CH	-	46.12	15.34	15.34	4.38
7A383D1406	3A	9	DIS	UT	AB	-	2	CH	-	21.24	0.00	5.68	2.24
7A383D1405	3A	9	CO	AB	AB	AB	1	CH	-	20.34	7.76	6.78	1.78
7A383D1404	3A	9	DIS	AB	AB	-	1	CH	-	31.12	0.00	7.62	2.30
7A383D1403	3A	9	PRO	AB	AB	AB	2	CH	-	28.94	7.86	6.48	1.48
7A383D1398	3	-	PRO	AB	AB	AB	1	CH	-	22.28	9.46	9.46	2.08
7A383D1395	3A	-	DIS	AB	AB	-	1	CH	-	32.46	0.00	11.28	3.10
7A383D1408	3A	9	PRO	UT	AB	-	2	CH	-	13.20	0.00	6.58	1.48
7A383D1407	3A	9	PRO	AB	AB	AB	1	CH	-	20.44	0.00	7.76	2.66
7A383D1409	3A	9	PRO	AB	AB	AB	1	CH	-	18.06	0.00	3.54	1.04
7A383D1379	3U	-	PRO	RET	AB	ST	2	CH	-	18.64	0.00	8.38	2.10
7A383D1412	2	-	CO	AB	AB	AB	1	CH	-	16.56	6.08	3.70	1.40
7A383D1411	2	-	MED	AB	AB	-	1	CH	-	18.36	0.00	7.38	1.62
7A383D1415	3A	-	POR	AB	AB	AB	1	CH	-	10.24	0.00	5.22	1.22
7A383D1413	2	-	CO	AB	AB	AB	1	CH	-	23.22	10.42	7.48	2.20
7A383D1416	3A	-	MED	AB	AB	-	1	CH	-	18.00	0.00	9.74	4.06
7A383D1417	3A	-	MED	AB	AB	-	1	CH	-	24.08	0.00	7.84	2.46
7A383D1422	3A	-	MED	AB	AB	-	1	CH	-	28.32	0.00	6.82	1.38
7A383D0317	2	-	CO	AB	AB	AB	2	CH	-	19.74	7.78	7.36	2.96
7A383D0052	2	-	PRO	AB	AB	AB	1	CH	-	18.00	0.00	7.90	2.28
7A383D0725	3U	-	PRO	AB	AB	AB	2	CH	-	16.82	0.00	9.94	2.28
7A383D0775	3	-	PRO	UT	UT	AB	1	CH	-	19.08	0.00	7.54	1.76
7A382C0033	2	-	MED	AB	AB	-	1	CH	-	19.52	0.00	7.24	1.68
7A383D1072	3A	-	PRO	AB	AB	AB	2	CH	-	23.80	0.00	6.96	2.06
7A382B0057	2	-	DIS	AB	AB	-	1	CH	-	12.06	0.00	8.34	1.74
7A382B0048	2	-	CO	AB	UT	AB	1	CH	-	34.36	11.62	8.10	2.24
7A383C0103	3	-	DIS	AB	AB	-	1	CH	-	26.74	0.00	7.84	2.38
7A382B0044	2	-	MED	AB	UT?	-	1	CH	-	8.62	0.00	0.00	0.92
7A383D1433	3A	-	CO	AB	AB	AB	1	CH	-	36.24	15.68	13.28	4.52
7A383D1432	3A	-	PRO	AB	AB	AB	1	CH	-	16.78	6.74	5.50	1.58
7A383D1430	3A	-	PRO	AB	AB	AB	1	CH	-	14.64	4.92	4.92	1.28
7A383D1425	3A	-	DIS	AB	AB	-	1	CH	-	7.62	0.00	3.14	0.78

Table 38: Microblade/blade attributes continued

ARTNO	LEV	FEA	SEG	ERA	ERB	HM	# A	RM	PL	L	W1	W2	T
7A382C0552	2	-	PRO	RET	AB	AB	1	CH	-	0.00	0.00	13.32	7.06
7A382C0540	3	-	MED	RET	AB	-	1	CH	-	0.00	0.00	2.86	2.12
7A382C0447	3	-	DIS	UT	UT	-	1	QC	16:A	36.52	6.96	6.92	1.76
7A382C0495	3A	-	DIS	UT	UT	ST	2	QC	16:B	28.22	6.76	6.68	1.40
7A383D0419	3	-	PRO	AB	AB	ST	2	QC	16:C	25.36	6.54	6.50	2.16
7A382C0200	2	-	PRO	UT	UT	SN	2	QC	-	22.42	10.62	10.44	2.56
7A383D0413	3	-	PRO	AB	AB	ST	2	QC	-	14.58	6.88	6.56	1.74
7A383D0545	3L	-	PRO	UT	-	ST	1	QC	-	17.94	6.78	6.70	2.44
7A383D1304	3A	-	PRO	AB	AB	?	2	QC	-	17.32	6.08	6.04	1.22
7A382C0111	2	-	PRO	UT	UT	AB	1	QC	-	20.10	7.20	6.38	1.74
7A383D0233	2	-	DIS	AB	UT?	-	1	QC	-	14.56	5.48	5.32	1.00
7A382C0187	2	-	PRO	AB	AB	AB	2	QC	-	10.76	3.84	3.72	2.16
7A383D1093	2	-	MED	AB	AB	-	1	QC	-	14.12	4.36	4.30	0.96
7A383D0885	3A	-	MED	AB	AB	-	2	QC	-	14.90	5.00	4.42	1.70
7A383D0980	3	-	PRO	RET	RET	ST	2	QC	-	10.22	9.42	9.38	2.00
7A383D0460	3A	-	PRO	AB	AB	AB	1	QC	-	17.22	6.96	5.76	1.78
7A382C0387	3A	-	PRO	UT	AB	SN	1	QC	-	16.48	5.92	5.38	1.16
7A382C0415	3A	-	DIS	AB	-	AB	1	QC	-	14.46	0.00	0.00	0.86
7A383D0781	3A	-	MED	AB	AB	-	2	QC	-	15.96	0.00	8.54	1.34
7A382C0487	3A	-	PRO	UT	UT	ST	1	QC	-	22.66	7.94	7.78	2.56
7A382C0118	2	-	MED	AB	AB	-	1	QC	-	17.16	6.40	6.22	2.00
7A382C0450	3A	-	CO	AB	AB	ST	2	QC	-	15.20	4.42	4.48	1.28
7A382C0172	2	-	MED	AB	AB	-	1	QC	-	13.12	5.40	4.62	1.70
7A383D0510	3	-	MED	AB	AB	-	1	QC	-	16.12	0.00	7.62	2.02
7A383D0607	3A	-	CO	AB	AB	ST	2	QC	-	25.92	8.02	7.94	2.38
7A383D0516	3	-	PRO	UT	AB	AB	1	QC	-	15.52	6.02	4.74	1.64
7A382C0363	3	-	MED	AB	AB	-	2	QC	-	11.94	4.32	4.16	1.22
7A382C0153	2	-	PRO	AB	AB	ST	2	QC	-	13.92	5.30	5.14	1.38
7A383D0542	3A	-	PRO	AB	AB	AB	2	QC	-	19.00	7.44	6.74	1.80
7A383C0074	2	-	DIS	AB	AB	-	2	QC	-	8.42	4.48	4.24	0.72
7A383D0607	3A	-	PRO	AB	AB	AB	2	QC	16:D	15.90	0.00	6.88	1.80
7A382C0514	3	-	MED	AB	AB	-	2	QC	-	8.48	4.32	4.26	1.44
7A383D1112	2	-	MED	AB	AB	-	2	QC	-	13.00	7.48	7.10	1.96
7A383D1375	3U	-	MED	AB	AB	-	1	QC	-	9.72	0.00	5.28	2.38
7A383D0013	2	-	MED	UT	UT	-	1	QC	-	18.00	7.54	7.54	2.22

Appendix C
Artefact Distribution Maps

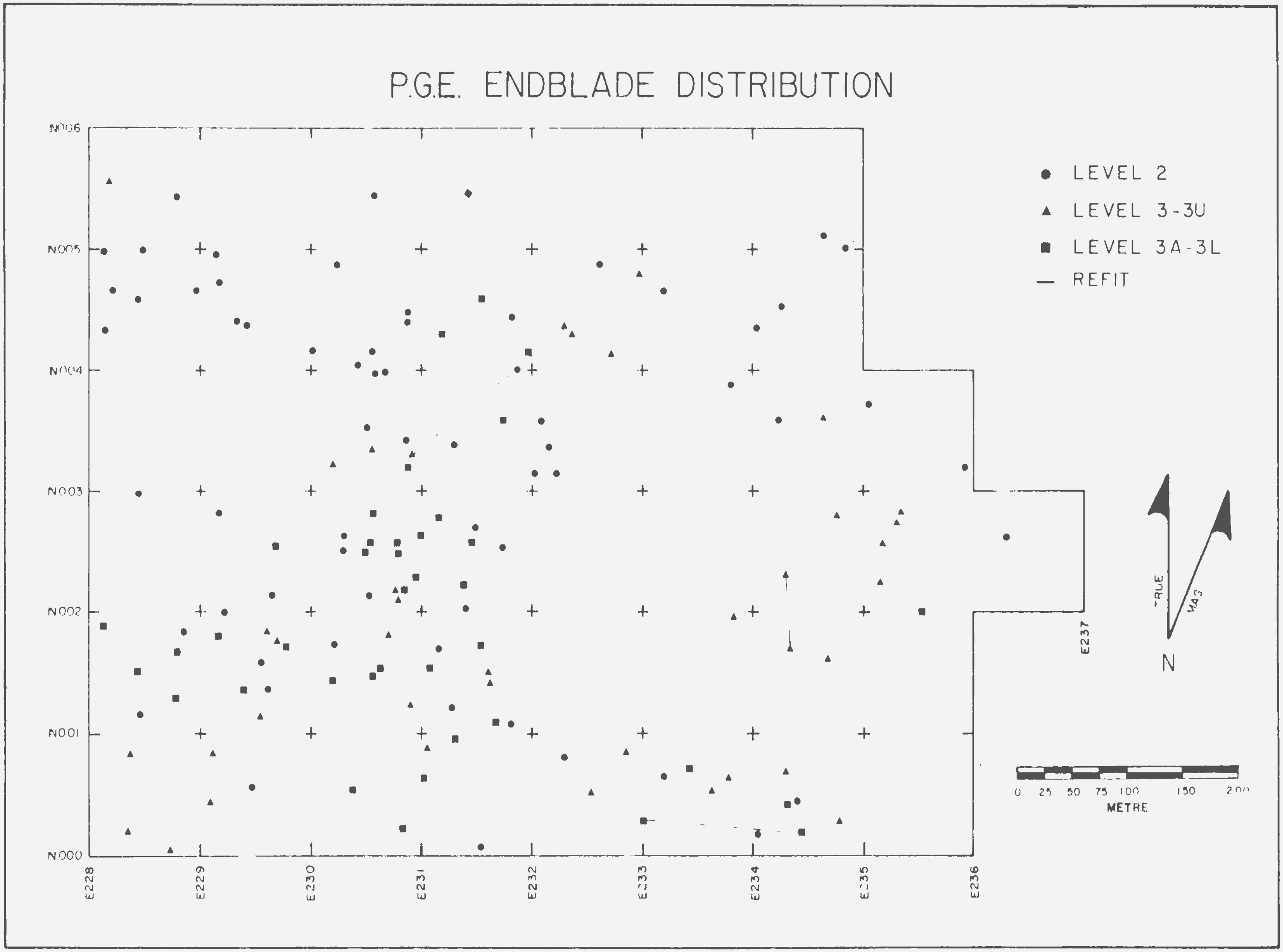

Figure 26: Endblade distribution

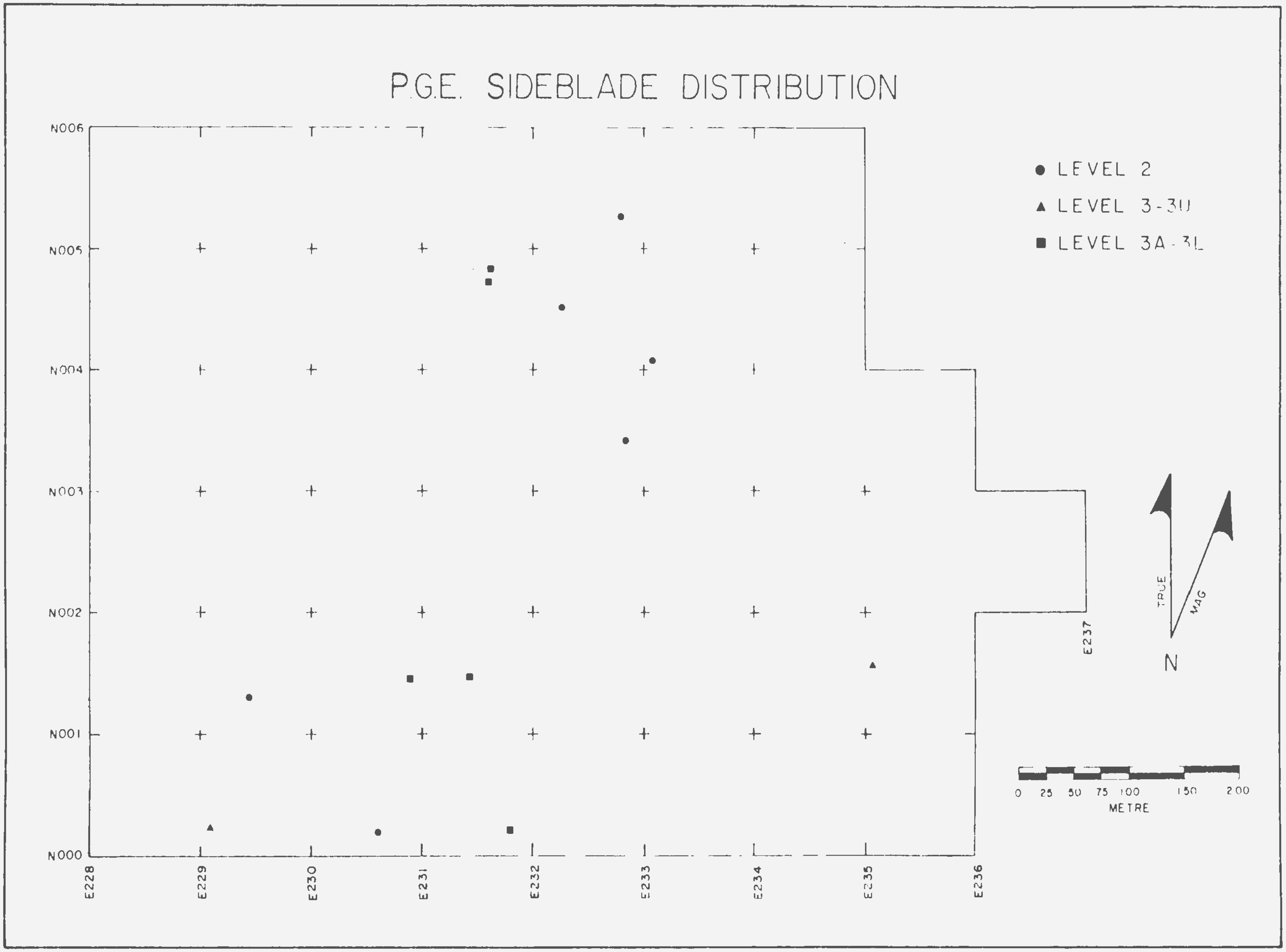

Figure 27: Sideblade distribution

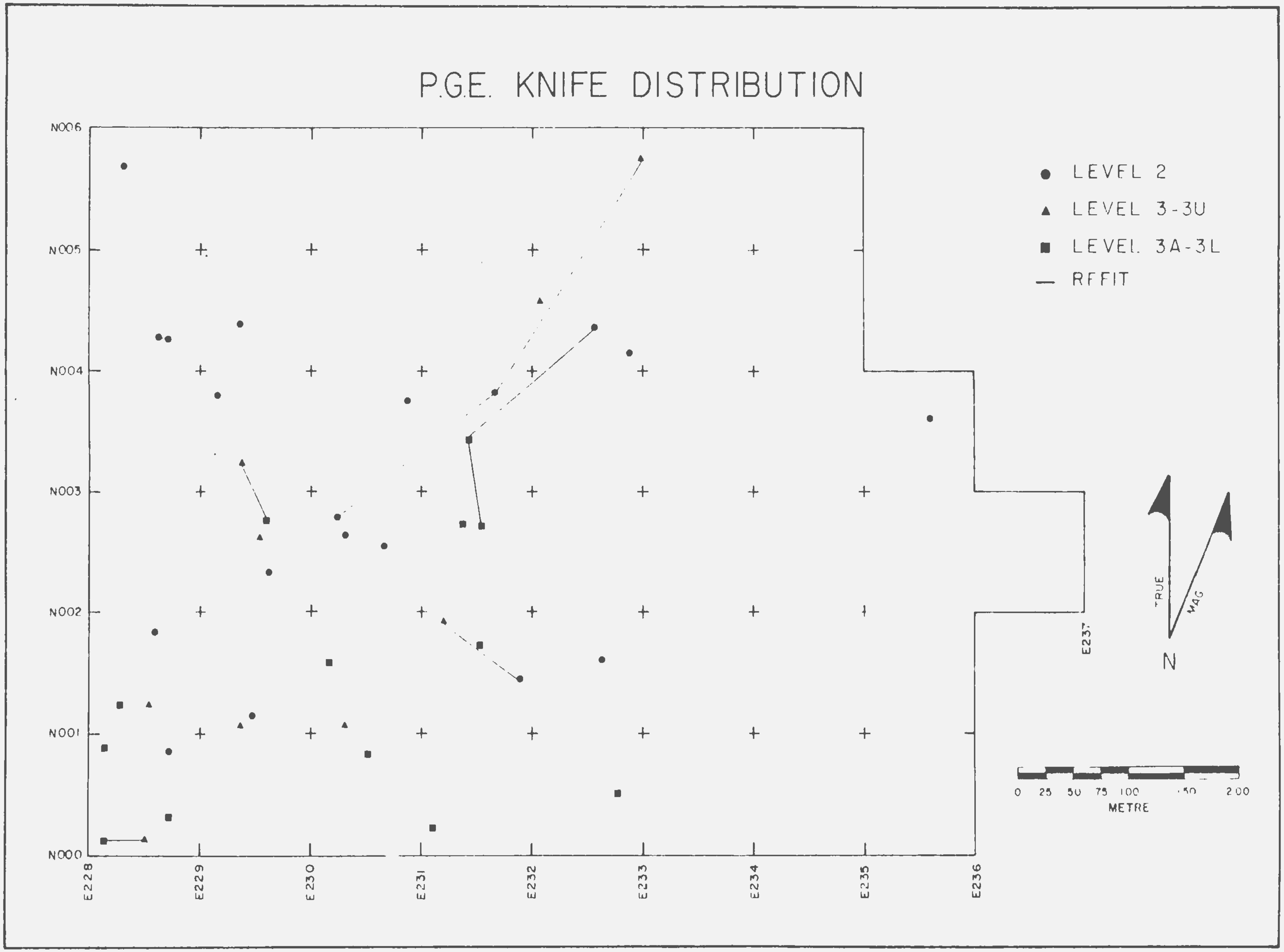

Figure 28: Knife distribution

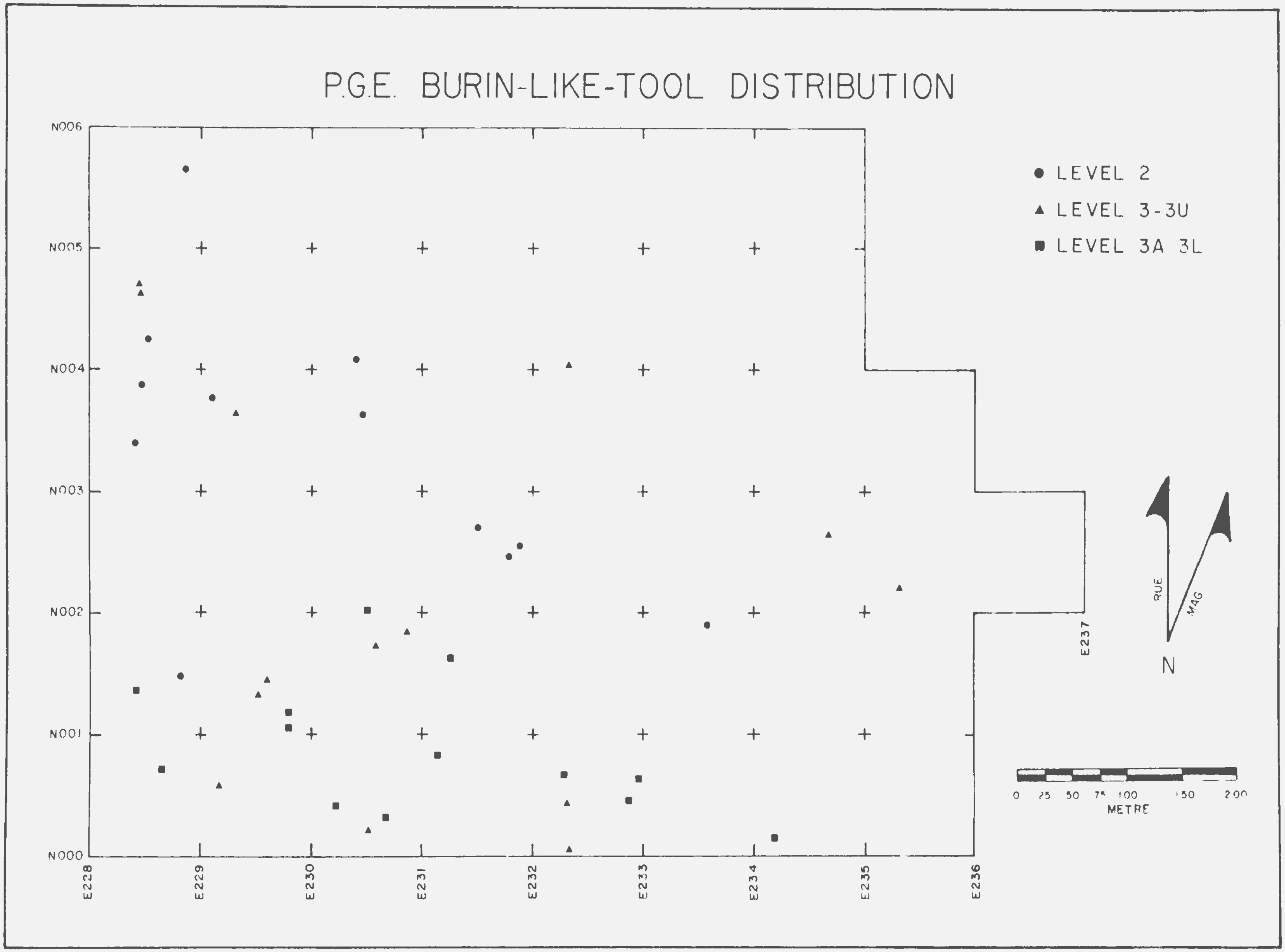

Figure 29: Burin-like-tool distribution

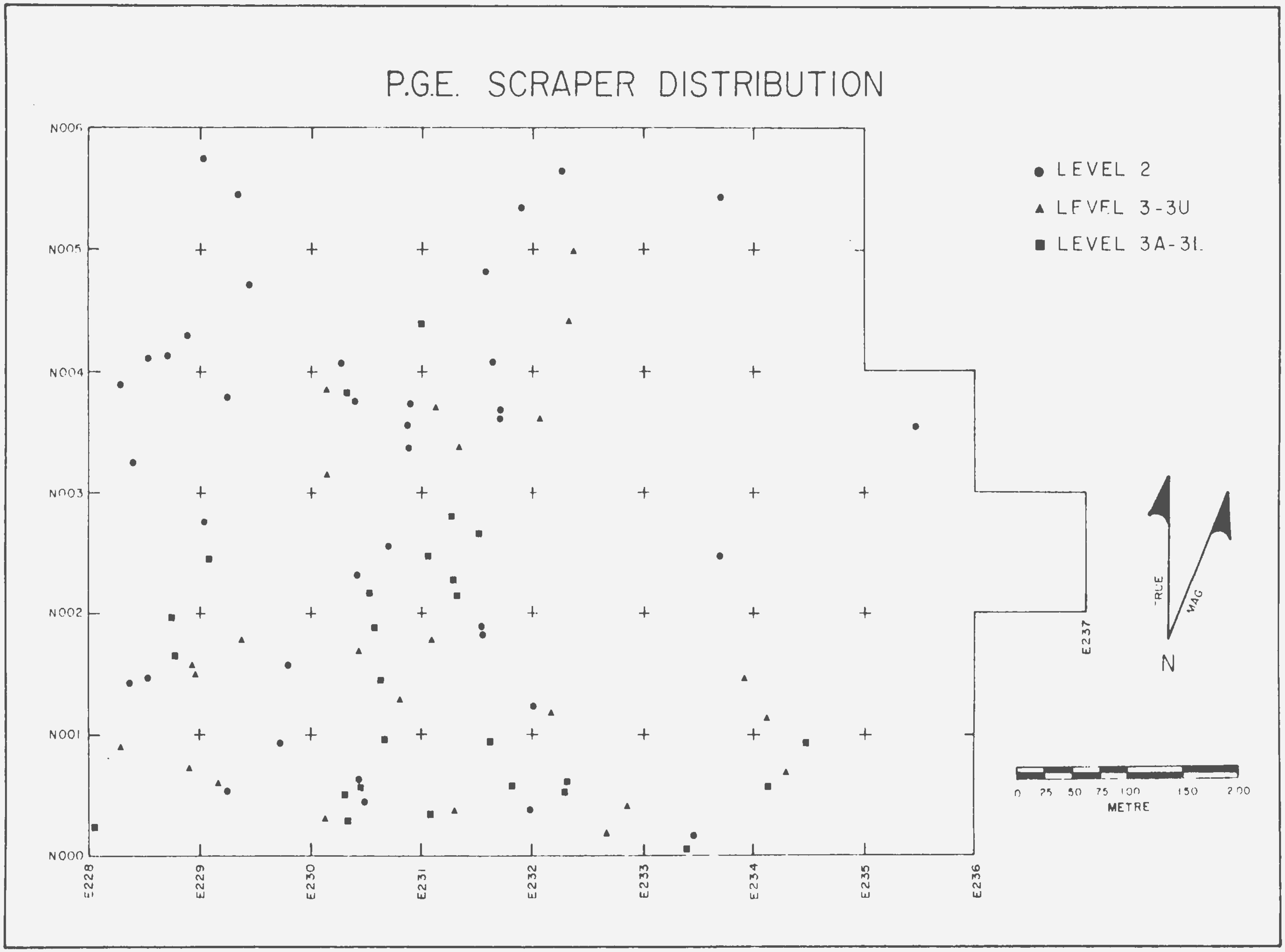

Figure 30: Scraper distribution

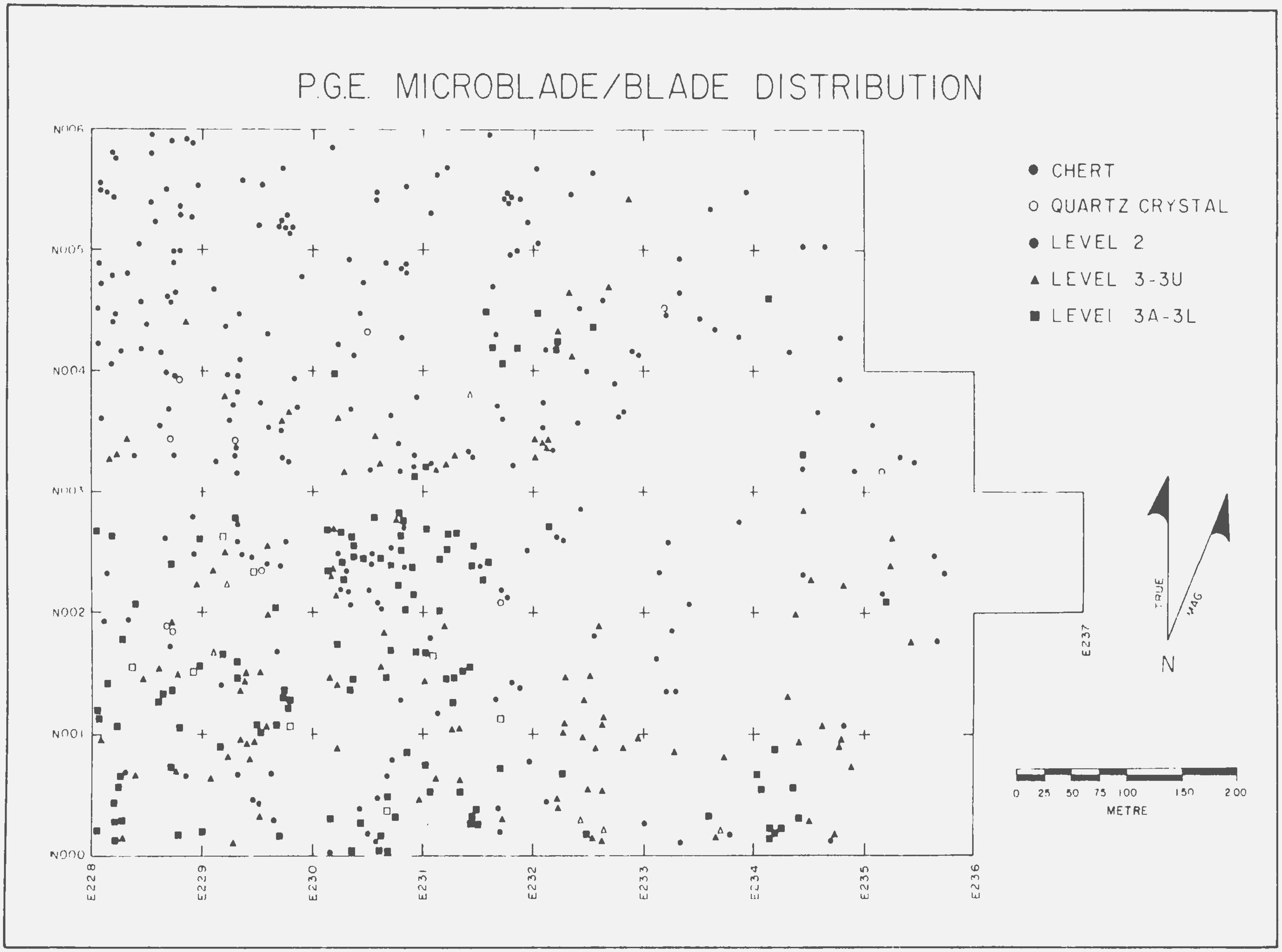

Figure 31: Microblade/blade distribution

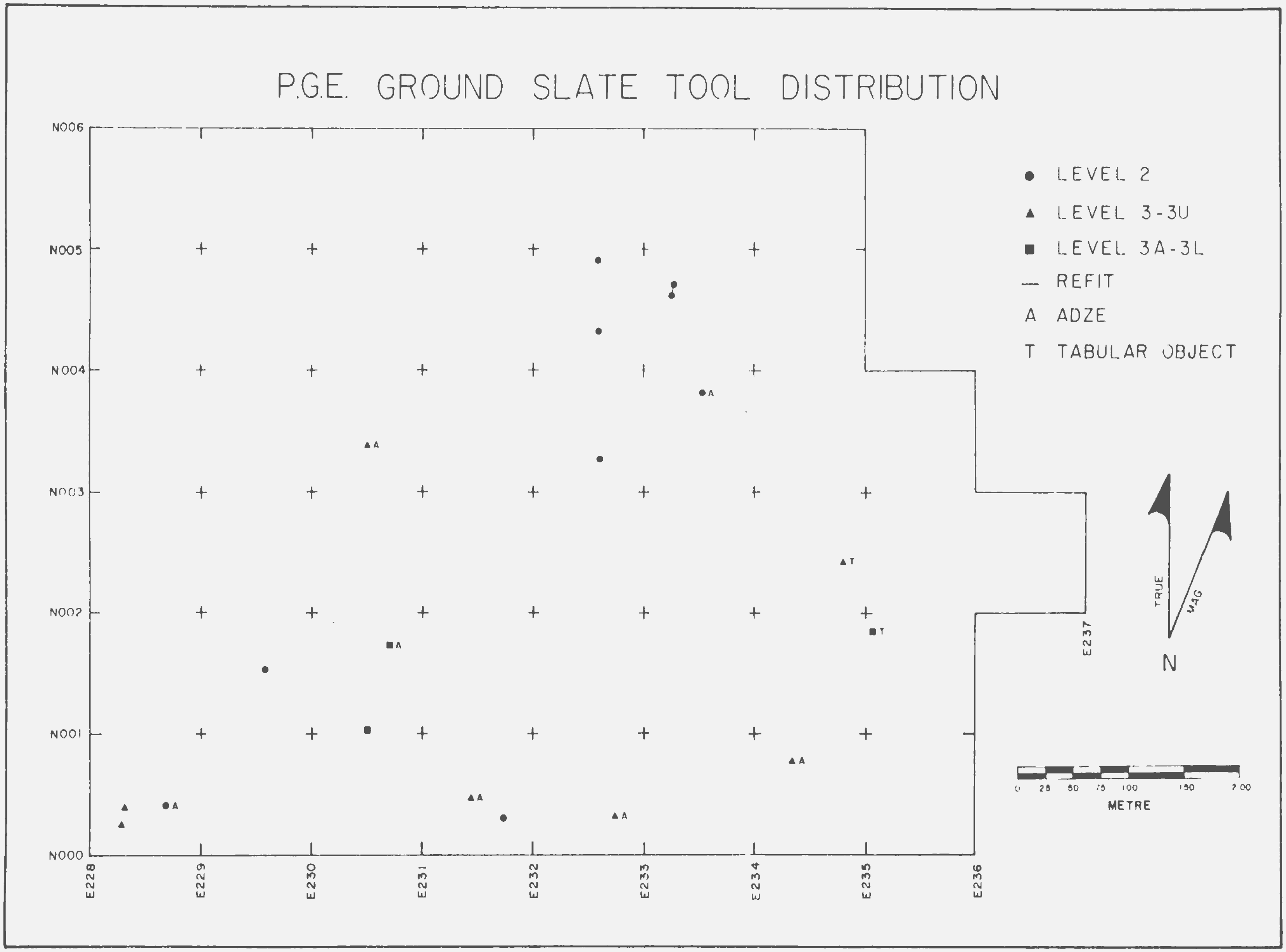

Figure 32: Ground slate tool distribution

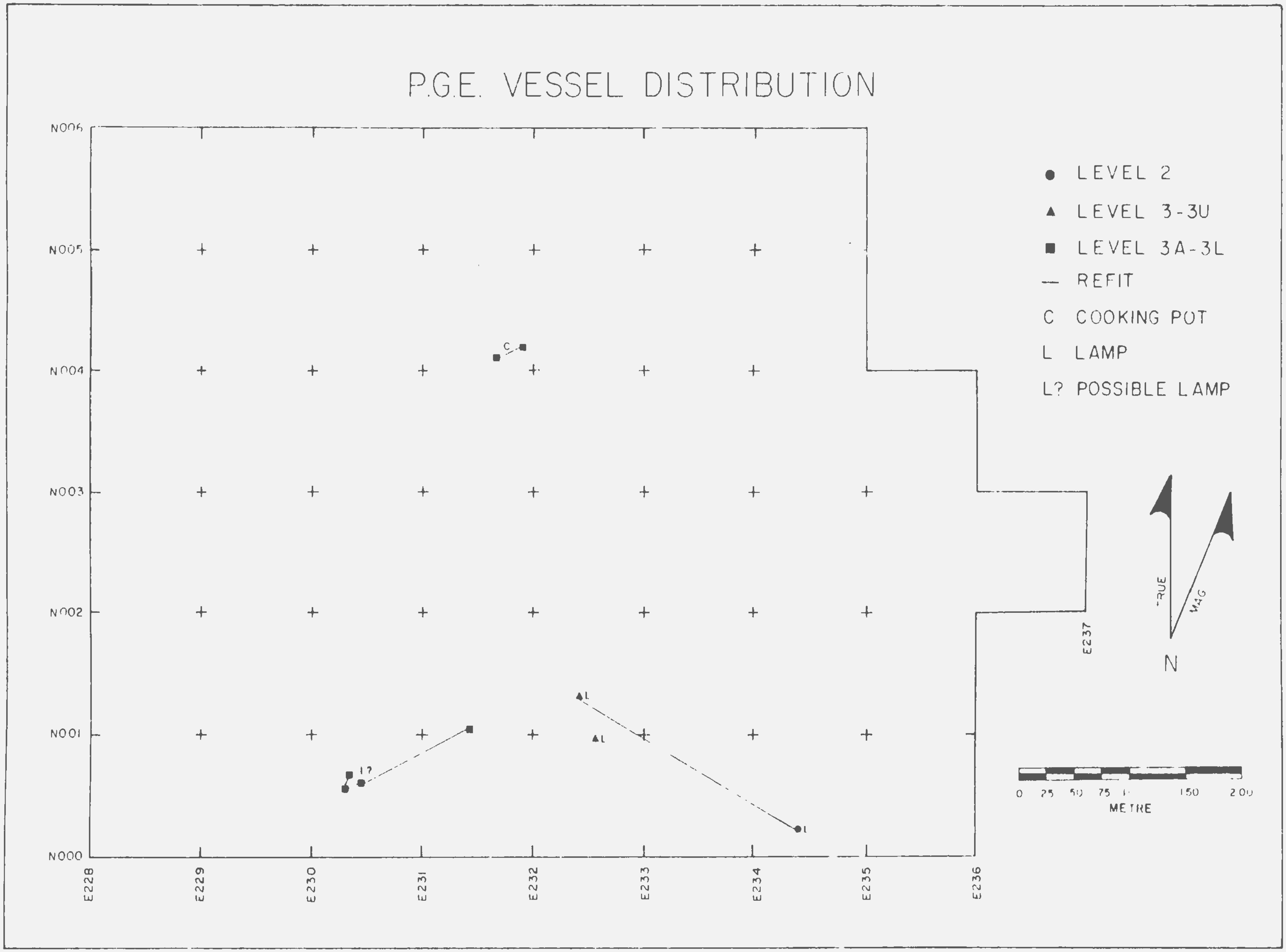

Figure 33: Vessel distribution

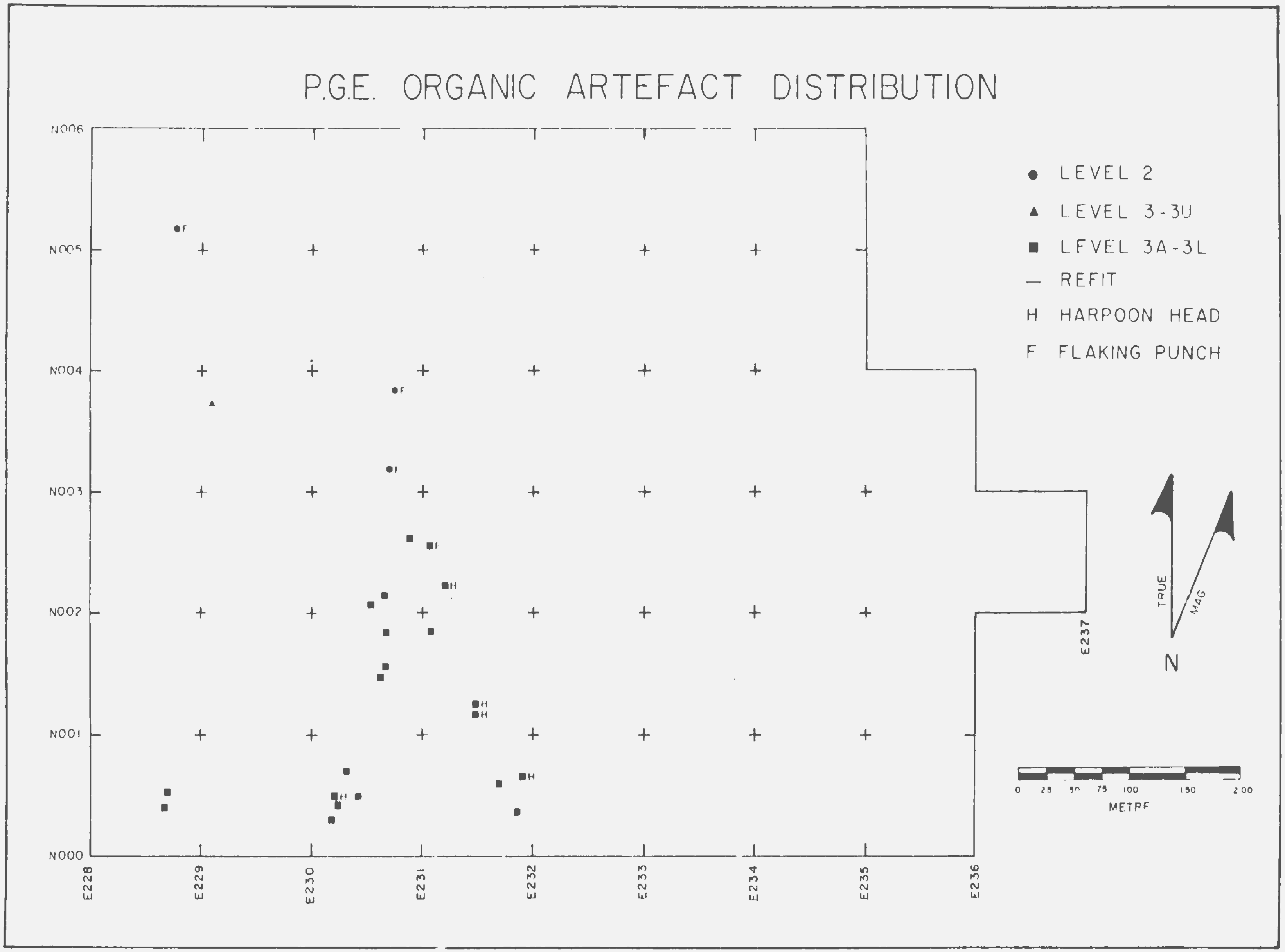

Figure 34: Organic artefact distribution